

## PYCNOGONIDA FROM THE CARIBBEAN AND THE STRAITS OF FLORIDA

BIOLOGICAL RESULTS OF THE UNIVERSITY OF MIAMI  
DEEP-SEA EXPEDITIONS

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### ABSTRACT

Forty-five species of Pycnogonida in five families are recorded from the upper sublittoral zone to the deep sea. Of these, nine taxa are new (in the genera *Eurcyde*, *Heterofragilia*, *Paranymphon*, *Nymphon*, *Parapallene*, *Pallenopsis*, and *Anoplodactylus*). Numerous extensions in geographic and bathymetrical range are recorded. A hermaphrodite species of *Pallenopsis* is described.

The Pycnogonida of the earlier cruises of the PILLSBURY and GERDA, organized by the University of Miami, have been described in a previous paper (Stock, 1975). The present article is based on the Caribbean materials of the later cruises. Pacific samples are also available, but will be the subject of a future study.

I am indebted to Drs. F. M. Bayer (Washington) and L. B. Holthuis (Leiden) for sorting and making available the Pycnogonida of the PILLSBURY, GERDA, ISELIN and GILLISS cruises. All specimens have been preserved in the collections of the Zoölogisch Museum, Amsterdam.

### SPECIES RECORDED IN THE PRESENT STUDY

FAMILY AMMOTHEIDAE: *Eurcyde unispina* new species; *E. raphiaster* Loman, 1912; *Heterofragilia major* new species; *Ascorhynchus pararmatus* Stock, 1975; *A. coleii* Hedgpeth, 1943; *A. ovicoxa* Stock, 1975; *Paranymphon filarium* new species; *Achelia sawayai* Marcus, 1940; *A. gracilis* Verrill, 1900.

FAMILY COLOSSENDEIDAE: *Pentacolossendeis reticulata* Hedgpeth, 1943; *Colossendeis macerrima* Wilson, 1881; *C. leptorhynchus* Hoek, 1881; *C. gardineri* Carpenter, 1907; *C. arcuata* A. Milne Edwards in Filhol, 1885; *C. colossea* Wilson, 1881.

FAMILY NYMPHONIDAE: *Nymphon aemulum* Stock, 1975; *N. floridanum* Hedgpeth, 1948; *N. macrum* Wilson, 1880; *N. vulsum* new species; *N. surinamense* Stock, 1975; *Neonymphon caecum* Stock, 1955.

FAMILY CALLIPALLENIDAE: *Parapallene parviungicularis* new species; *Pallenoides spinulosa* Stock, 1955; *Callipallene brevirostris* (Johnston, 1837); *C. longicoxa* Stock, 1955.

FAMILY PHOXICHILIDIIDAE: *Pallenopsis* (*Pallenopsis*) *forcifer* Wilson, 1881; *P. (P.) schmitti* Hedgpeth, 1943; *P. (P.) kempfi* Stock, 1975; *P. (P.) childi* new species; *P. (P.) varioculata* new species; *P. (P.) mixta* new species; *P. P. sp.*; *Pallenopsis* (*Bathypallenopsis*) *longirostris* Wilson, 1881; *P. (B.) mollissima* (Hoek, 1881) *atlantica* new subspecies; *P. (B.) calcanea* Stephensen, 1933; *P. (B.) tydemani caraibica* Stock, 1975; *Anoplodactylus insignis* (Hoek, 1881); *A. insignis calcaratus* new variety; *A. iuleus* Stock, 1975; *A. lentus* Wilson, 1878; *A. massiliiformis* Stock, 1975; *A. multiclavus* Child, 1977; *A. petiolatus* (Krøyer, 1844); *A. simulator* Stock, 1975; *Endeis flaccida* Calman, 1923; *E. mollis* (Carpenter, 1904); *E. sp.*

### BIOGEOGRAPHIC REMARKS

After the boreal Atlantic, the Caribbean is one of the best known areas in the world as far as Pycnogonida are concerned (Table 1). The fauna is very varied with 122 specific and infraspecific taxa in 30 genera (the total number of pycnogonid species is about 750 in some 80 genera). Of the 90 *Anoplodactylus* species known, not less than 30 are found in the West Indies, many of them (as far as we know) endemic to the region. It was rather a surprise for me that even from

Table 1. Review of the Pycnogonida recorded from Florida (south of 30°N), the Caribbean, and the northern coast of South America (west of the Amazon River). Legend: Only references to literature pertaining to the West Indies have been listed, coded as follows: H = Hedgpeth, 1948; S1 = Stock, 1954a; S2 = Stock, 1955; S3 = Stock, 1975; S4 = Stock, 1979; S5 = Stock (present paper); B = Bourdillon, 1955; C1 = Child, 1977; C2 = Child, 1977; C3 = Child, 1979; C4 = Child, 1982b; C5 = Child, 1982a. x designates predominantly deep-water species (depth > 200 m)

	Pan-tropical or cosopol- itan deep- water	Florida, Greater Antilles, Bahamas, Lesser Antilles (north of Tobago), Central America (north of Panama)	Lesser Antilles (west of Tobago), Panama, Colombia, Venezuela	Guyanas, Brazil	W. Africa	Mediterranean	Central America (Pacific)
	I	II	III	IV	V	VI	VII
<b>Ammonotheidae</b>							
<i>Achelia</i>							
<i>echinata</i> (S2)		+			+	+	
<i>gracilis</i> (H, S1, S3, S4, S5, B)		+	+				
<i>langi</i> ? (S4)		+			+	+	
<i>sawayai</i> f. <i>typica</i> (H, S1, S2, S3, S4, S5, C1, C3, C4)	(+)	+	+	+	+		
<i>sawayai</i> f. <i>besnardi</i> (S2)		+		+			
<i>Ammonothea</i>							
<i>appendiculata</i> (S1, S2, S3, S4, B, C1, C3, C4)		+	+	+	+	+	+
<i>exornata</i> (S3, S4, C3, C4)		+	+				
<i>marcusi</i> (H, S3, S4, C3, C4)		+	+				+
<i>rugulosa</i> (H, S1, S3, S4, B, C3, C4)		+	+	+			+
<i>spinifera</i> (C3)		+					+
<i>Ascorhynchus</i>							
<i>castelli</i> (S3)		+				+	
<i>castellioides</i> (S3, C3)		+	+				
<i>colei</i> (H, S5)		+					
<i>discrepans</i> (S2)		+					
<i>latipes</i> (H, S1, S3, S4, C3, C4)		+	+		+		
x <i>ovicoxa</i> (S3, S5, C5)		+					
x <i>pararmatus</i> (S3, S5)		+					
x <i>serratus</i> (H, S3, C4?)		+					
<i>Cilunculus</i>							
x <i>antillensis</i> (S2)		+					
<i>Ephyrogymna</i>							
x <i>circularis</i> (H)		+					

Table 1. Continued

	Pan-tropical or cosmopol- itan deep- water I	Florida, Greater Antilles, Bahamas, Lesser Antilles (north of Tobago), Central America (north of Panamá) II	Lesser Antilles (west of Tobago), Panamá, Colombia, Venezuela III	Guyanas, Brazil IV	W. Africa V	Mediterranean VI	Central America (Pacific) VII
<i>Eurycyde</i>							
<i>acanthopus</i> (S4)			+				
<i>clitellaria</i> (S2, C3)		+					+
<i>curvata</i> (C3)			+				
<i>gorda</i> (C3)		+	+				
<i>raphiaster</i> (H, S1, S3, S4, S5, C3, C4)		+	+		+		
<i>unispina</i> (S5)							
<i>Hedgpethius</i>							
<i>mamillatus</i> (C4)		+					
<i>tridentatus</i> (C1, C4)		+					
<i>Heterofragilia</i>							
x <i>fimbriata</i> (H)		+					
x <i>major</i> (S5)		+					
<i>Nymphopsis</i>							
<i>anarthra</i> (H)			+				
<i>duodorsospinosa</i> (H, S3, C3, C4)		+	+				+
<i>Paranymphon</i>							
x <i>filarium</i> (S5)		+					
x <i>spinosum</i> (C5)							
<i>Prototrygaeus</i>			+				
<i>ammothelloides</i> (S3)				+			
<i>Tanystylum</i>							
<i>acuminatum</i> (S1, S4)		+					
<i>birkelandi</i> (C3, C4)		+	+				
( <i>calicirostrum</i> ) (H, C3)		(+)		+			
		(Bermuda)					

Table 1. Continued

	Pan-tropical or cosmopol- itan deep- water I	Florida, Greater Antilles, Bahamas, Lesser Antilles (north of Tobago), Central America (north of Panamá) II	Lesser Antilles (west of Tobago), Panamá, Colombia, Venezuela III	Guyanas, Brazil IV	W. Africa V	Mediterranean VI	Central America (Pacific) VII
<i>conirostrum</i> (S4)		+	+		+	+	
<i>geminum</i> (S1, S3, S4, B, C3)		+	+				
<i>hummelincki</i> (S1)		+					
<i>isabellae</i> (S2)		+	+	+			
<i>isthmiacum difficile</i> (S3, S4, C3)			+	+	+		
<i>orbiculare</i> (S1, S3, B)		+	+	+	+	+	
<i>tubirostrum</i> (S1, S3, B, C3, C4)		+	+				+
<b>Colossendeidae</b>							
<i>Colossendeis</i>							
<i>x arcuata</i> (S5)		+			+		
<i>x colossea</i> (S5)	+	+	+				
<i>x gardineri</i> (S5)		+					
<i>x leptorhynchus</i> (S5)	(+)	+					
<i>x macerrima</i> (S3, S5, C3)	+	+	+	+	+		+
<i>x melancholicus</i> (S3)		+					
<i>Pentacolossendeis</i>							
<i>x reticulata</i> (H, S5)		+	+				
<i>Rhopalorhynchus</i>							
<i>claudius</i> (S3)		+					
<b>Nymphonidae</b>							
<i>Neonymphon</i>							
<i>x caecum</i> (S2, S5)		+		+			
<i>Nymphon</i>							
<i>aemulum</i> (S2, S3, S5)		+		+			
<i>floridanum</i> (H, S2, S3, S4, S5, C3, C4)		+	+	+			
<i>x macrum</i> (H, S5)		+					

Table 1. Continued

	I	II	III	IV	V	VI	VII
	Pantropical or cosmopol- itan deep- water	Florida, Greater Antilles, Bahamas, Lesser Antilles (north of Tobago), Central America (north of Panamá)	Lesser Antilles (west of Tobago), Panamá, Colombia, Venezuela	Guyanas, Brazil	W. Africa	Mediterranean	Central America (Pacific)
<i>x stromi</i> (S3)		+		+			
<i>surinamense</i> (S3, S5)			+				
<i>vulsum</i> (S5)							
Callipallenidae							
<i>Callipallene</i>							
<i>belizae</i> (C4)		+	+	+		+	
<i>brevirostris</i> (S1, S3, S4, S5, B, C5)		+	+	+		+	
<i>emaciata</i> (H, S3, C3, C4)		+	+	+		+	
(x) <i>longicoxa</i> (S2, S5)		+					
<i>phantoma</i> (H, S1)		+				+	
<i>Cheilopallene</i>							
<i>clavigera</i> (S2)		+					
<i>Palleneoides</i>							
<i>spinulosa</i> (S2, S3, S5)		+					
<i>Parapallene</i>							
<i>bermudensis</i> (C4)		+					
x <i>parviunguicularis</i> (S5)		+					
<i>Pigrogromitus</i>							
<i>timsanus</i> (H, S3, C3, C4)	+	+	+			+	+
Phoxichilidiidae							
<i>Anoplodactylus</i>							
<i>alloytrius</i> (C3)			+				
<i>arcuatus</i> (C2)		+	+				
<i>bahamensis</i> (C2, C4)		+					
<i>batangensis</i> (= <i>stylirostris</i> , = <i>tenuirostris</i> )	+	+	+		+		+
(H, S1, B, S3, S4, C3, C4)							
<i>digitatus</i> (= <i>investigatoris</i> ) (B)		+					

Table 1. Continued

	Pan-tropical or cosmopol- itan deep- water I	Florida, Greater Antilles, Bahamas, Lesser Antilles (north of Tobago), Central America (north of Panamá) II	Lesser Antilles (west of Tobago), Panamá, Colombia, Venezuela III	Guyanas, Brazil IV	W. Africa V	Mediterranean VI	Central America (Pacific) VII
<i>evelinae</i> (H, S1, S2, S4, C3, C4)		+	+	+	+		+
<i>galetenis</i> (C3)		+		+			
<i>guyanensis</i> (C2)							
<i>imswe</i> (C4)		+					
<i>insigniformis</i> (S3, S4, C3)		+	+	+			
<i>insignis</i> (H, S1, S2, S3, S5)		+	+				
<i>insignis calcaratus</i> (S5)		+	+				
<i>x iuleus</i> (= "maritimus") (H, S3, S5)		+	+				
<i>x jonesi</i> (= "antillianus") (S3, C1, C3, C4)		+	+				
<i>x lentus</i> (H, S3, S5)		+	+				
<i>maritimus</i> (= "parvus") (S1, S2, B, C4)		+	+	+	+		
<i>massiliiformis</i> (S3, C3, S5)		+	+	+			
<i>microps</i> (B, S4)		+	+	+			
<i>monotrema</i> (= "robustus") (H, S1, S2, S3, S4, C3, C4)		+	+				
<i>multiclavus</i> (C2, C3, C4, S5)		+	+				
<i>pectinus</i> (H, S2, S3, S4, C1, C3, C4)	(+)	+	+	+	+		
<i>petiolatus</i> (S3, S5)		+	+	+			
<i>x pharus</i> (S3)		+					
<i>polignacti</i> (H)		+					
<i>portus</i> (= "carvalho") (H, S1, S2, S3, S4, C3, C4)	+	+	+	+	+	+	+
<i>quadratispinosus</i> (H)		+					
<i>simulator</i> (S3, S5)		+					
<i>siri</i> (C3)			+				
<i>trispinosus</i> (S1, S3, C3)			+		+		
<i>x typhlops</i> (H, S2, C5)		+		+			
<i>Endeis</i>							
<i>flaccida</i> (S3, S5, C3)	+	+	+				+
<i>meridionalis</i> (S4)	+		+				
<i>mollis</i> (S3, S5, C3)	+		+	+	+		
<i>spinosa</i> (H, C3, C4)		+	+	+	+	+	

Table 1. Continued

	I Pantropical or cosmopol- itan deep- water	II Florida, Greater Antilles, Bahamas, Lesser Antilles (north of Tobago), Central America (north of Panamá)	III Lesser Antilles (west of Tobago), Panamá, Colombia, Venezuela	IV Guyanas, Brazil	V W. Africa	VI Mediterranean	VII Central America (Pacific)
<i>Pallenopsis (Pallenopsis)</i>							
<i>candidoi</i> (S3)		+		+			
<i>childi</i> (S5)		+	+				
<i>x forficera</i> (S3, S5)		+	+	+			
<i>kempfi</i> (S3, S5)			+				
<i>mixta</i> (S5)			+	+			
<i>schmitti</i> (H, S3, C3, S5)		+	+	+			+
<i>varioculata</i> (S5)			+	+			
<i>Pallenopsis (Bathypallenopsis)</i>							
<i>x calcanea</i> (S5)	(+)	+					
<i>x longirostris</i> (S5)		+					
<i>x molissima atlantica</i> (S5)		+	+				
<i>x tydemani caribica</i> (S3, S5)		+		+			
Rhynchothoracidae							
<i>Rhynchothorax</i>							
<i>architectus</i> (C3, C4)		+	+				
<i>arenatus</i> (C4)		+					
Austrodecidae							
<i>Pantopipetta</i>					+		
<i>x brevicauda</i> ("longituberculata") (C5)				+			
Pycnogonidae							
<i>Pentapycnon</i>							
<i>geayi</i> (H, S3)		+	+				
<i>Pycnogonum</i>							
<i>cessaci</i> (S1, S3, C3)			+		+		+
<i>guyanae</i> (S3)				+			
<i>reticulatum</i> (H, S1, S3, C3)		+	+	+			+

such a relatively well-studied area as the Caribbean, nine out of 45 taxa (20%) in the present collections were new. The endemic element in the pycnogonid fauna (not just of the Caribbean, but of the entire tropical western Atlantic) is pronounced (Table 1), in particular that of the littoral and shelf zones. The deep-water species tend to have a larger distribution in the Atlantic or even world-wide, but this does not come as a surprise.

Several shallow-water genera are known only from the West Indies and from the Indo-West Pacific (e.g., *Parapallene*, *Heterofragilia*, *Rhopalorhynchus* s. str.), reflecting Tethyan distribution patterns, but at a lower taxonomic level, there are distinct faunistic affinities with the Mediterranean and the tropical African Atlantic (e.g., *Pycnogonum cessaci*, *Eurycyde raphiaster*, *Achelia sawayai*, *Ammothella appendiculata*, *Callipallene emaciata*, *C. brevirostris*, *C. phantoma*, *Ascorhynchus castelli*, *Endeis spinosa*, etc.).

Several species of shallow-water biotas are even pantropical (*Endeis meridionalis*, *E. mollis*, *E. flaccida*, *Pigrogromitus timsanus*, *Anoplodactylus portus*, *A. batangensis*, etc.).

The fauna of the Brazilian shelf and slope, not listed in Table 1, though having several species in common with the Caribbean, is marked also by a high percentage of species not yet known from elsewhere.

Table 1 shows a high number of species that are actually only known from the northern part of the Caribbean (Greater Antilles, Lesser Antilles north of Grenada, coasts of Central America north of Panamá) and the Straits of Florida. In part this may reflect the more intensive collecting activities, especially of the R. V. GERDA in the Straits of Florida, but it is noteworthy that the southern Caribbean (Panamá, Colombia, Venezuela and the Lesser Antilles west of Tobago) has several endemics and several species in common with the Guyanas and Brazil west of the mouth of the Amazon River. These species are not known from the northern Caribbean (e.g., *Eurycyde curvata*, *E. gorda*, *E. acanthopus*, *Nymphopsis anarthra*, *Nymphon vulsum*, *Anoplodactylus allotrius*, *A. massiliformis*, *A. stri*, *A. tri-spinosus*, *Pycnogonum cessaci*, *P. guayanae*), indicating that a southern Caribbean province may be distinguishable.

The presently known facts point to a dominance of small- or very small-sized species in the littoral and upper sublittoral zones in the West Indies, and of larger sized species in deeper waters. No doubt, this is due in part to the difficulty to detect small-sized Pycnogonida in the catch of deeper trawls. When carefully collected and sorted, deeper waters may yield also small Pycnogonida, as the records of the various French explorations (Centre Océanologique de Bretagne) in the Bay of Biscay and the English Channel prove.

Table 1 lists all Pycnogonida known from the central part of the West Indian region. Not included are the American coasts south of Cape Hatteras (with the exception of the Straits of Florida) and the Brazilian coasts south of the mouth of the Amazon.

### Family AMMOTHEIDAE

The most plesiomorphous Pycnogonida are located in this family. Such plesiomorphies are: the presence of segmented probosci (*Eurycyde*) or vestiges of a segmented proboscis (*Ascorhynchus*), an articulated abdomen (*Eurycyde*), a 2-segmented chelifore scape (*Ammothella*, *Eurycyde*, *Heterofragilia*, *Ascorhynchus* . . .), a simple chela (fingers curved, gaping, unarmed) (*Eurycyde*, *Ascorhynchus* . . .), completely segmented trunks (many genera), presence of the basic number of 10 segments in the palps (*Eurycyde*, *Ascorhynchus*, *Ammothella* . . .) and ovigers



(many genera), the absence of differentiation in the propodal armature into heel and sole elements (*Eurycyde*, *Ascorhynchus* . . .), the presence of auxiliary claws (many genera), the presence of a terminal oviger claw (many genera), etc.

At the same time, tendencies towards apomorphy in all appendages are already indicated in this family, making evolutionary lines to the higher evolved families plausible. Such apomorphies are: reduction of the abdomen (*Tanystylum* . . .), fusion of the two scape segments (*Ascorhynchus* . . .), reduction of the chela in adults (*Achelia*), sometimes only of part of the chela (*Hemichela*), development of teeth on the chelar dactyli (*Paranymphon*), reduction of the entire chelifore (*Tanystylum*), reduction of the number of palp segments (*Achelia*, *Trygaeus*, *Tanystylum* . . .) or formation of extra palp segments (*Nymphonella*), reduction of the number of oviger segments (*Trygaeus*, *Tanystylum*), reduction of the auxiliary claws or reduction of the main claw (*Ammothella*), differentiation of the propodal armature (*Achelia*, *Tanystylum* . . .), reduction of the terminal oviger claw (*Trygaeus*), etc.

This makes the family a really basic one: it shows the most plesiomorphous characters (in particular the presence of articulations in proboscis and abdomen connecting them with the Palaeopycnogonida) and it has the potential for all apomorphous development present in the other families.

### Genus *Eurycyde* Schiödte, 1857

This is one of the most plesiomorphous genera of Recent Pycnogonida. The number of species in this genus has rapidly increased during the last few decades. Many species are elaborately armed or ornamented, making them one of the more bizarre looking taxa within the sea-spiders.

#### *Eurycyde unispina* new species

##### Figure 1

*Material*.—1 ♀ (holotype); GERDA St. 978 (Straits of Florida): 24°32'N, 81°07'W; 100 fm (183 m); 3-II-1968.

*Description*.—Trunk compact; lateral processes separated by narrow intervals, unarmed. Ocular tubercle strongly pointed; eyes well-pigmented, located at some distance from tip; subdistal armature reduced to one long anterior spine and one short posterior spine. Abdomen with angular bend at about midlength; at bend it bears 4 slender spines. Proboscis with articulated basal stalk.

Chelifore scape 2-segmented, slender; segment 1 with disto-lateral apophysis bearing 1 long spine. Second segment with some short spines. Chela with globular palm, fingers reduced to 2, apparently 2-segmented, vestiges.

Palp segment 3 longest; segments 8 to 10 subequal, almost twice as long as wide, setiferous. Segment 7 also setiferous, slightly longer than 8.

Oviger structure normal. Segments 7 to 10 with 2 rows of special spines, 1 row of larger and 1 row of smaller ones. Special spines on proximal segments with some 5 coarse teeth on each margin; spines on distal segments tend to be more finely toothed. Distalmost, larger, special spine on oviger segment 10 bears 5 coarse teeth on proximal margin, but appears glabrous at distal margin; opposes the unarmed distal claw. Spine formula for row of larger spines 5:3:3:3.

Legs thin. Coxa 1 with tall dorsal spur on all legs. Coxa 2 with 1 posterior spine in legs 3 and 4. Coxa 3 devoid of strong armature. Femur with 2 dorsal spines at midlength, and 1 longer and 3 shorter distal spines. Tibiae 1 and 2 with several long spines. Long spines barbate or plumose. Tarsus short. Propodus regularly

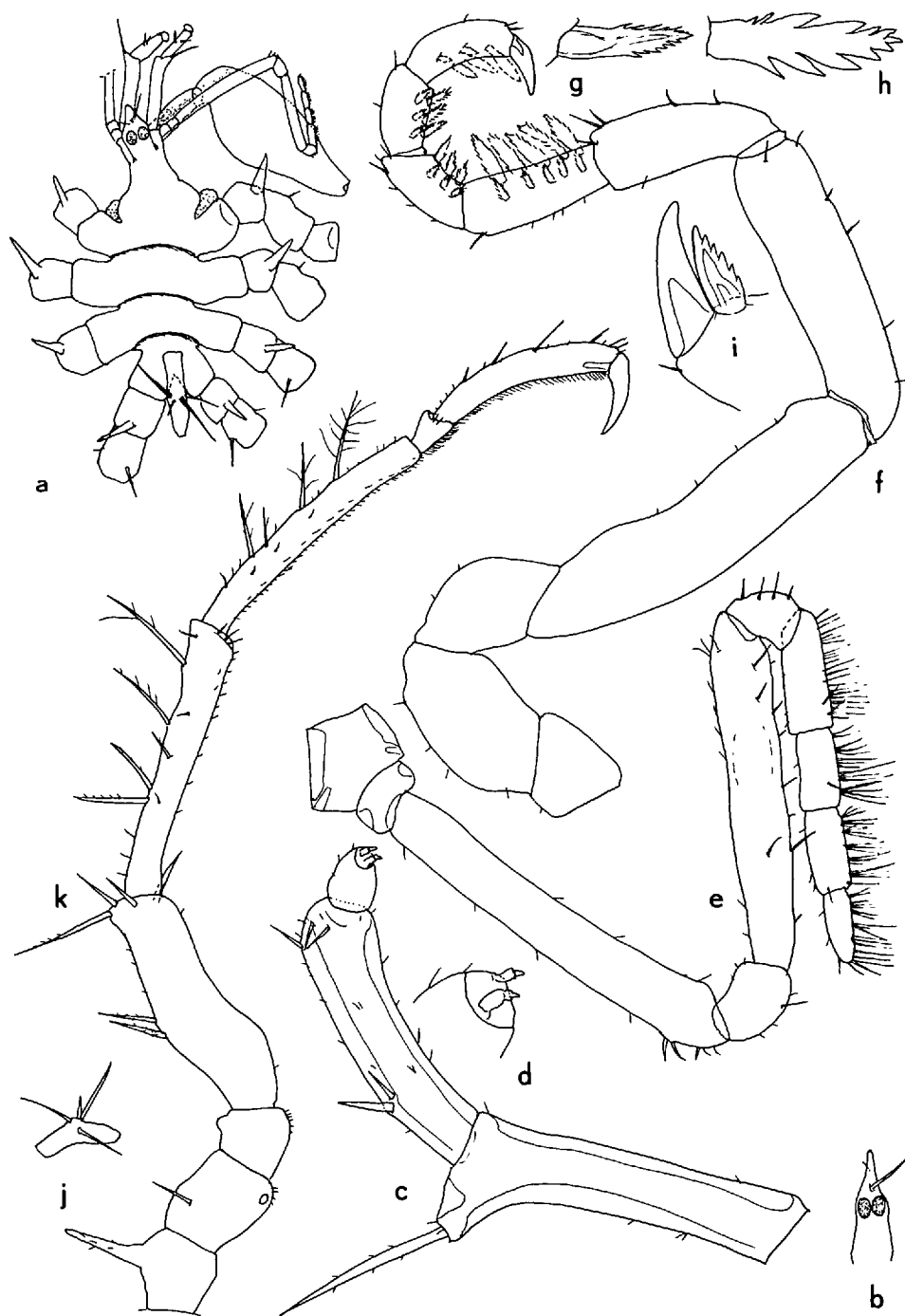


Figure 1. *Eurycyde unispina* new species, ♀ holotype: a, body, dorsal; b, ocular tubercle, frontal; c, chelifore; d, chela; e, palp; f, oviger; g, one of the distal compound oviger spines; h, one of the proximal compound oviger spines; i, oviger claw; j, abdomen, from the left; k, third leg.

curved; sole armed with numerous small spinulus of uniform size. Claw short, no auxiliary claws.

**Remarks.**—Five species in the genus *Eurycyde* are, like the new taxon, devoid of spiniform processes on the crurigers. Of these, *E. gorda* Child, 1979, differs in having a crown of long spines on the ocular tubercle; the remaining species have 0, 1, or 2 long spines only in that position. *E. hispida* (Krøyer, 1844) lacks coxal spiniform processes and has the eyes almost in terminal position on the ocular tubercle. *E. encantada* Child and Hedgpeth, 1971, has 2 spurs on coxa 1 (one in the new species), the eyes are likewise in a subterminal position, and the propodal sole is less densely packed with spinules.

Our knowledge of *E. spinosa* Hilton, 1916, and *E. longisetosa* Hilton, 1942, is restricted to Hilton's delirious illustrations. Both seem to have 2 coxal spurs, and both species have long spines on scape segment 2 (short spines in the new species). Moreover, their abdominal armature is subterminal, instead of at midlength as in the new species.

The new species is easily distinguished from the common West Indian shallow-water species, *E. raphiaster* Loman, 1912, by the absence of a spiny crown on the ocular tubercle, the position of the abdominal spines, and the absence of long spines of scape segment 2.

**Etymology.**—From the Latin words *uni* (=one) and *spina* (=spine), alluding to the presence of one long spine on scape segment 1, on the ocular tubercle, and on coxa 1.

**Measurements of Holotype (in mm).**—Trunk length (frontal margin cephalic somite to tip 4th lateral process) 1.43; width across 2nd lateral processes 0.83; length stalk proboscis 0.38; length distal part proboscis 0.90; length 1st scape segment 0.43; length 2nd scape segment 0.37. Third leg: 1st coxa 0.21; 2nd coxa 0.29; 3rd coxa 0.18; femur 0.75; 1st tibia 0.86; 2nd tibia 0.83; tarsus 0.11; propodus 0.61; claw 0.25.

### *Eurycyde raphiaster* Loman, 1912

*Eurycyde raphiaster*, Stock, 1975: 979 (refs.); Stock, 1979: 3; Child, 1979: 21, fig. 5i–j; Child, 1982b: 360.

**Material.**—1 specimen; PILLSBURY St. 1284 (S of Hispaniola): 17°35'N, 71°25'W; 18–22 m; 19-VII-1970.

**Remarks.**—A highly characteristic, Amphi-Atlantic species.

### Genus *Heterofragilia* Hedgpeth, 1943

Members of this genus are sporadically recorded. They show a typically Tethyan distribution (one species is known from the Caribbean, one from Japan). A second Caribbean species was collected during the PILLSBURY cruises.

### *Heterofragilia major* new species

Figure 2, Table 2

**Material.**—1 ♀ (holotype); PILLSBURY St. 881 (E of St. Vincent): 13°20.8'N, 61°02.5'W; 576–842 fm (1,053–1,540 m); 6-VII-1969.

**Diagnosis.**—Differs from the only other Caribbean species, *H. fimbriata* Hedgpeth, 1943, in having a mid-dorsal tubercle on trunk somite 4, in having palp segment 7 > 6, and in having slender palp segments 8 to 10. Table 2 summarizes

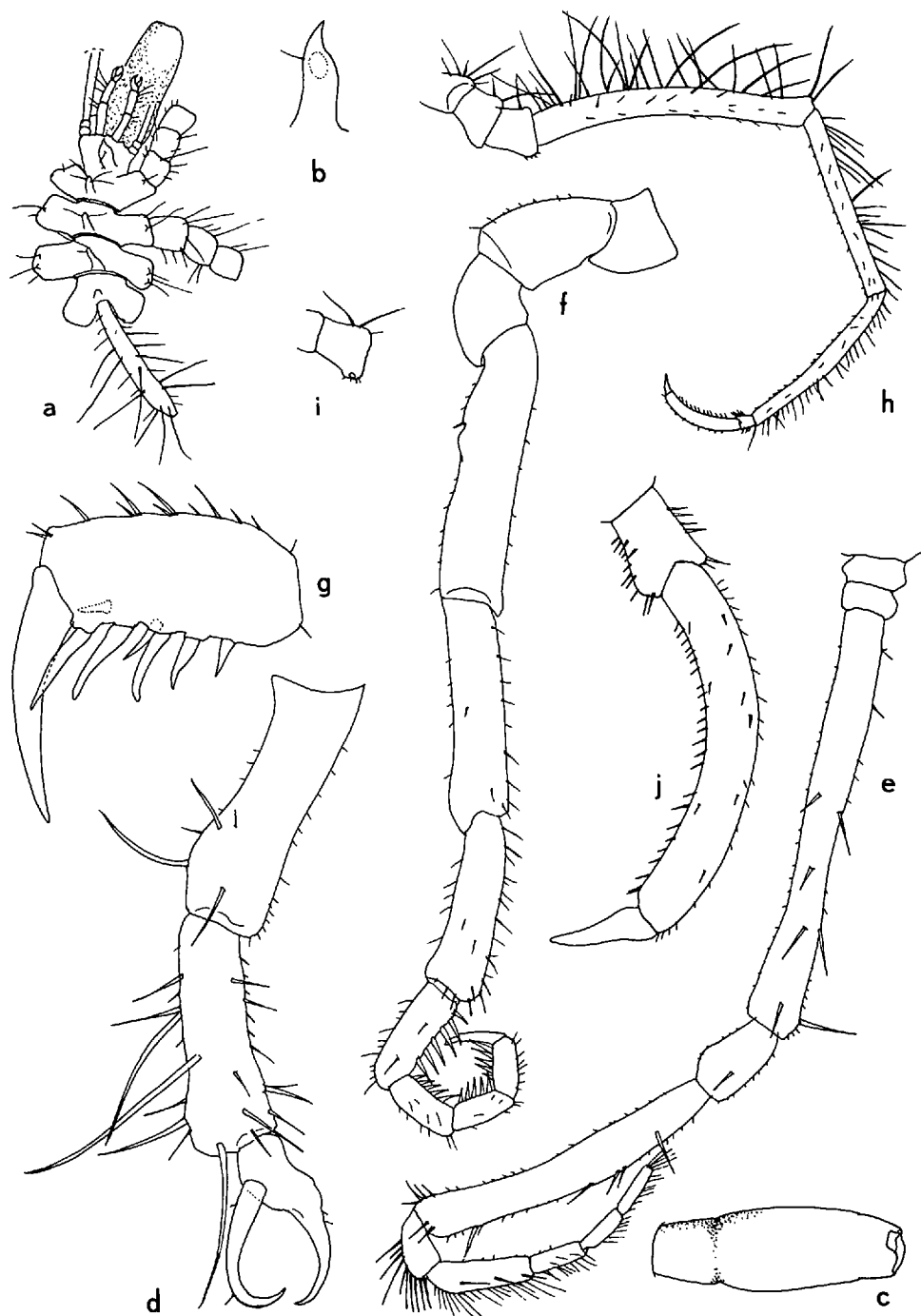


Figure 2. *Heterofragilia major* new species, ♀ holotype: a, body, dorsal; b, ocular tubercle, from the right; c, proboscis, from the right; d, chelifore; e, palp; f, oviger; g, distal oviger segments; h, first leg; i, coxa 2 of second leg; j, distal segments of first leg.

Table 2. Salient differences between three *Heterofragilia* species

	<i>fimbriata</i>	<i>amica</i>	<i>major</i>
Lateral processes	short, hardly separated	long, well separated	as <i>fimbriata</i>
Tubercle on trunk somite 4	absent	present	as <i>amica</i>
Armature abdomen	short spines	long setae	as <i>amica</i>
Size (mm) proboscis	3.8	3.3–4.3	6.4
Length trunk (to base abdomen)	3.5	3.7–5.0	5.9
Chelifore scape	segments short; segm. 1 = segm. 2	slender; segm. 1 > 2	short, segm. 1 = segm. 2
Palp segm. 6 and 7	subequal, together $\frac{2}{3}$ of 5th segm.	segm. 7 $\gg$ 6, together $\frac{2}{3}$ of 5th segm.	segm. 7 $\gg$ 6, together $\frac{1}{2}$ of 5th segm.
Palp segm. 8 to 10	short, with few setules	slender, elongate, setose	as <i>amica</i>
Oviger segm. 10	twice as long as wide	3 times as long as wide	as <i>fimbriata</i>
Oviger claw	$\geq$ segm. 10	< segm. 10	as <i>fimbriata</i>
Legs	short setae on coxae, femur, tibia 1	long setae on coxae and femur, some on tibia 1	numerous long setae on coxae, femur and tibia 1, shorter setae on tibia 2
Propodus	moderately curved	moderately curved	strongly curved

the differences between the three known taxa within *Heterofragilia*: *H. major* new species, *H. fimbriata* (known from a single specimen caught in 871 m off Martinique) and *H. amica* Stock, 1954 (known from 2 specimens, caught west and southwest of Kyushu, Japan, at 165–203 m; vide Stock, 1954b, and Utinomi, 1955, 1971).

*Remarks.*—Table 2 shows that these three species are quite similar in most characters. Curiously enough, this specimen taken off St. Vincent looks more closely like the Japanese *H. amica* than like the Caribbean *H. fimbriata*. It is larger than both *amica* and *fimbriata*, but if all three had been found in one locality and not oceans apart, they would probably have been considered one variable species.

I prefer to classify the PILLSBURY specimen as a new species, pending the discovery of additional specimens which may shed more light on the variability.

I point to two interesting details in the morphology of the new species: (1) the genital pores are located on a slight swelling of coxa 2 of legs 2 to 4, but they are lacking on leg 1; (2) the palp is 10- (not 9-)segmented by subdivision of the short basal portion.

The remaining characters of the new species can be seen in the figure. The special oviger spines are arranged in 2 or 3 rows, according to the formula  $6(+6+2):5(+4+2):5(+4):5(+2)$ .

*Etymology.*—This is the largest *Heterofragilia* recorded so far. Hence the specific name *major* (Latin, =greater) is proposed.

*Measurements of Holotype (in mm).*—Trunk length (frontal margin cephalic somite to base abdomen) 5.90; width across 2nd lateral processes 4.66; length proboscis (ventral) 6.40; diameter proboscis 2.21; length abdomen 4.52; length 1st scape segment 0.97; length 2nd scape segment 0.94. Palp: segments 1+2 0.42; segm. 3 3.00; segm. 4 0.63; segm. 5 2.26; segm. 6 0.32; segm. 7 0.72; segm. 8

0.43; segm. 9 0.37; segm. 10 0.40. Second leg: 1st coxa 1.32; 2nd coxa 1.51; 3rd coxa 1.15; femur 8.75; 1st tibia 6.83; 2nd tibia 5.31; tarsus 0.52; propodus 2.35; claw 0.59.

### Genus *Ascorhynchus* Sars, 1877

This genus has several representatives in the West Indies (Stock, 1975; Child, 1979; 1982b). The present collections contain three species, previously collected only once or twice, but no species new to science or to this part of the world.

### *Ascorhynchus pararmatus* Stock, 1975

*A. pararmatus* Stock, 1975: 960–966, figs. 1–2.

**Material.**—1 specimen; ISELIN St. 137 (Bahamas): 26°07'N, 78°34.1'–78°36.6'W; 591 m; 27-IX-1973. 1 ♀; PILLSBURY St. 1125 (Bahamas): 25°16.2'N, 77°54.6'W; 2,085–2,195 m; 30-VIII-1969. 1 ♀; GERDA St. 158 (off Florida): 26°27'N, 79°21'W–26°36'N, 79°24'W; 540–531 m; 25-VI-1963. 1 ♀, 1 juv.; GERDA St. 782 (Straits of Florida): 25°15'N, 80°09'W; 55 fm (101 m); 15-VIII-1966. 1 ♂ ovig.; GERDA St. 911 (off Miami): 26°22'N, 79°17'W; 260 fm (475 m); 25-IX-1967. 1 ♂; GERDA St. 937 (off Florida): 26°25'N, 79°07'W; 265–258 fm (485–472 m); 1-X-1967. 1 ♂ ovig., 1 ♂; GERDA St. 938 (Straits of Florida): 26°19'N, 79°00'W; 275–270 fm (503–494 m).

**Remarks.**—All previous records are from the same region (Bahamas to Florida), and roughly between 400 and 700 m. The present collections extend the bathymetrical range from 101 m to 2,195 m.

### *Ascorhynchus colei* Hedgpeth, 1943

*A. colei* Hedgpeth, 1943: 50; Hedgpeth, 1948: 257–259, fig. 44g–k.

**Material.**—1 ♀; R/V SILVER BAY St. 2418 (Straits of Florida): 24°14'N, 81°24'W; 145–160 fm (265–293 m); 28-X-1960. 1 ♀; GERDA St. 972 (Straits of Florida): 24°24'N, 80°52'W; 126–121 fm (230–221 m); 3-II-1968. 1 ♀; GERDA St. 975 (Straits of Florida): 24°27'N, 81°15'W; 99–100 fm (181–183 m); 3-II-1968.

**Remarks.**—An apparently rare species, known from Florida, the Bahamas, and the Dominican Republic; bathymetrical range 0 to 160 fm (0–293 m). The distal segments of the legs are somewhat more slender and more setose than in the material illustrated by Hedgpeth, 1948.

### *Ascorhynchus ovicoxa* Stock, 1975

*A. ovicoxa* Stock, 1975: 969–972, figs. 5–6; Child, 1982a: 6.

**Material.**—1 ♀; GERDA St. 828 (Straits of Florida): 25°34'N, 79°54'W; 182–186 fm (333–340 m); 7-VII-1967.

**Remarks.**—This species was only known from five localities: four off Florida (Stock, 1975; Child, 1982a), and one north of Bermuda (Child, 1982a). The depth range previously recorded was 403–2,223 m; the present record extends this range into slightly shallower waters (333 m).

### Genus *Paranymphon* Caullery, 1896

This genus cannot be confused with any other pycnogonid, except *Hemichela* (in which the chela is devoid of the immovable finger). Hitherto, the genus remained monospecific, but a new species was collected during the GERDA cruises.

***Paranymphon filarium* new species**  
Figure 3

**Material.** — 1 ♀ (holotype); GERDA St. 1008 (Santaren Channel, N of Cuba): 24°03'N, 79°36'W—24°00'N, 79°42'W; 295–315 fm (539–576 m); 14-VI-1968. 1 ♀ (paratype); GERDA St. 828 (Straits of Florida): 25°34'N, 79°54'W; 182–186 fm (333–340 m); 7-VII-1967.

**Description.** — Body shape very similar to that of genotype. Ocular tubercle very tall, truncate at tip, with 2 termino-lateral tubercles; eyes not visible. Long lateral processes separated by V-shaped intervals; distally, space between lateral processes at least twice own diameter. Each lateral process dorsodistally armed with exceedingly long, filiform spur, curving upward. Abdomen points obliquely upward; longer and heavier than ocular tubercle. Proboscis ovoid to slightly conical.

Scape 1-segmented, distally setiferous. Chela with globular palm, armed with some 20 strong setae. Length of immovable finger about  $\frac{3}{4}$  of movable finger. Immovable finger with 11 irregular teeth, movable finger with 14 such teeth.

Palp 7-segmented; segment 2 has swelling slightly before the middle. All segments, but first, setiferous.

Oviger as in type-species; segments 5 and 6 with several stiff setae on ventral margin; terminal claw long, armed with 2 obsolescent teeth. Spine formula 4:2:1:2; special spines have smooth margins or bear 1 or 2 pairs of teeth.

Legs rather slender. Ventral margin of all segments, but for claw and coxae, bears small, densely crowded spinules. Tarsus shorter than propodus. Claw about  $\frac{2}{3}$  of length of propodus, bearing 1 inner spinule. Tarsus + propodus + claw shorter than tibia 2. Ripening ovaries visible in coxae and femur.

**Remarks.** — The present species is very similar to *P. spinosum* Caullery, 1896 (= *P. spinipes*, lapsus calami, Meinert, 1898 and 1899, caption of pl. IV). I have compared the West Indian material with specimens from the Bay of Biscay, the type area (Stock, 1978a), and I have observed the following differences: (1) The spurs on the lateral processes of *spinosum* are tall and conical, sometimes obelisk-like, but never thread-like and recurved. (2) The proboscis of *spinosum* (cf. Fig. 4c) is of a more pronounced cone shape, with a tapering distal part. (3) The sum of tarsus + propodus + claw is much greater than the length of tibia 2 in *spinosum* (Fig. 4d, e). (4) The ventral margin of the leg segments, in particular of the femur and tibia 1, is less closely set with spinules (Fig. 4d, e).

It should be noted that in *P. spinosum* the immovable finger of the chela usually is not much shorter than the movable one (a condition illustrated by Loman, 1912, fig. K, by Meinert, 1898 and 1899, pl. IV fig. 22, and in this paper, Fig. 4a), but in some large specimens, the mutual length of the fingers approaches the situation found in the new species (see Norman's, 1908, illustration on pl. 30 fig. 13, and Fig. 4b in this paper).

The palp of *P. spinosum* is similar to that of the new species (thus lacking a triangular, subdistal process on segment 2, unlike Loman's, 1912, fig. G). The special spine formula of the oviger of *P. spinosum* was in a dissected female 3:3:1:1 (a condition 1:1 for segments 9 and 10 was also found by Loman, 1912, and Bouvier, 1917).

**Etymology.** — The proposed specific name, *filarium* (Latin, =bearing threads) refers to the armature of the lateral processes.

**Distribution.** — The genotype, *P. spinosum*, is known from deep waters in the northern Atlantic and from some shallower localities in the western Mediterranean (references in Stock, 1978a: 204), as well as from Sagami Bay (Nakamura and

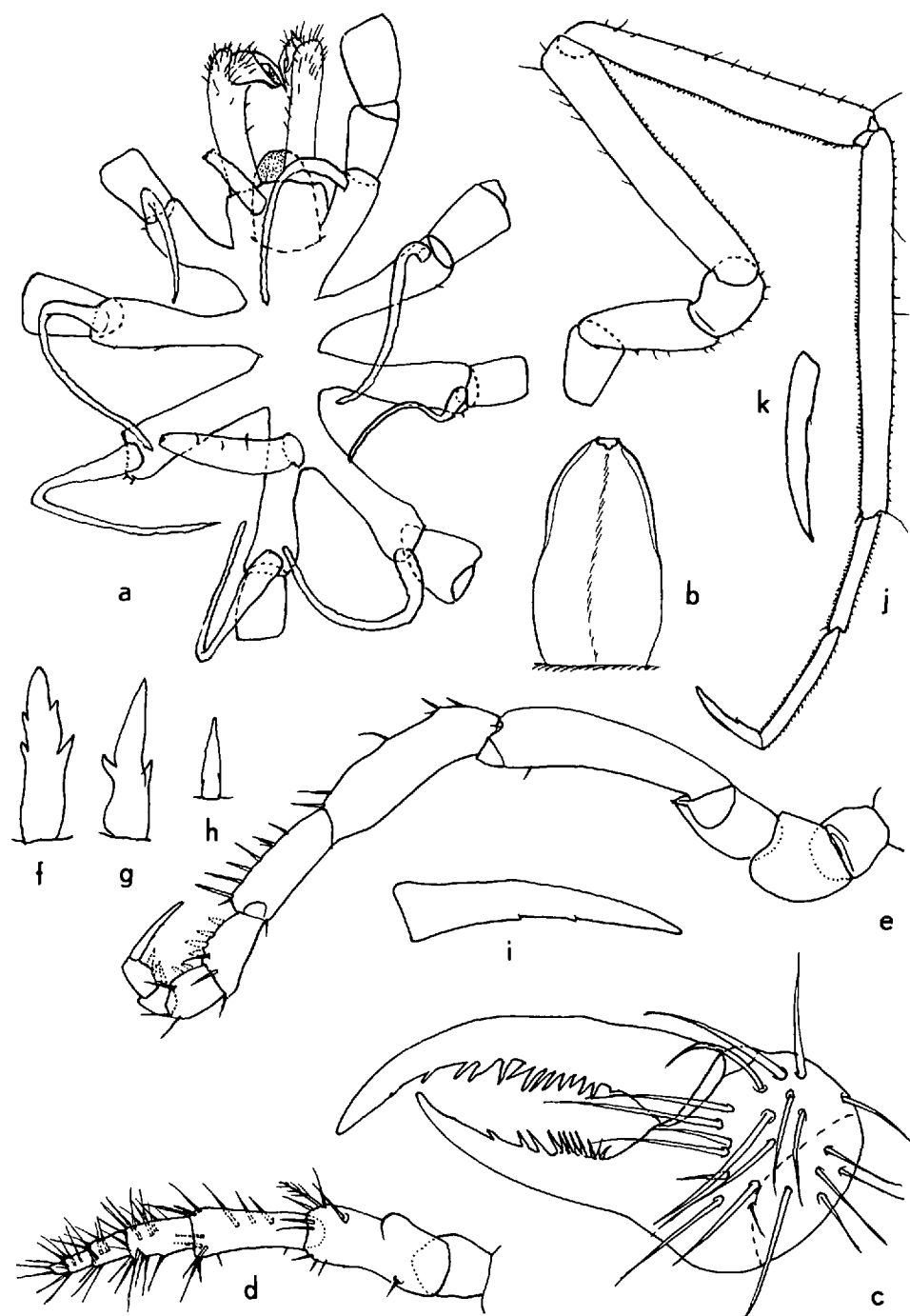


Figure 3. *Paranympheon filarium* new species, ♀ holotype: a, body, dorsal; b, proboscis, ventral; c, chela; d, palp; e, oviger; f, third special spine of oviger segment 7; g, first special spine of oviger segment 9; h, first special spine of oviger segment 10; i, oviger claw; j, third leg; k, claw of second leg.



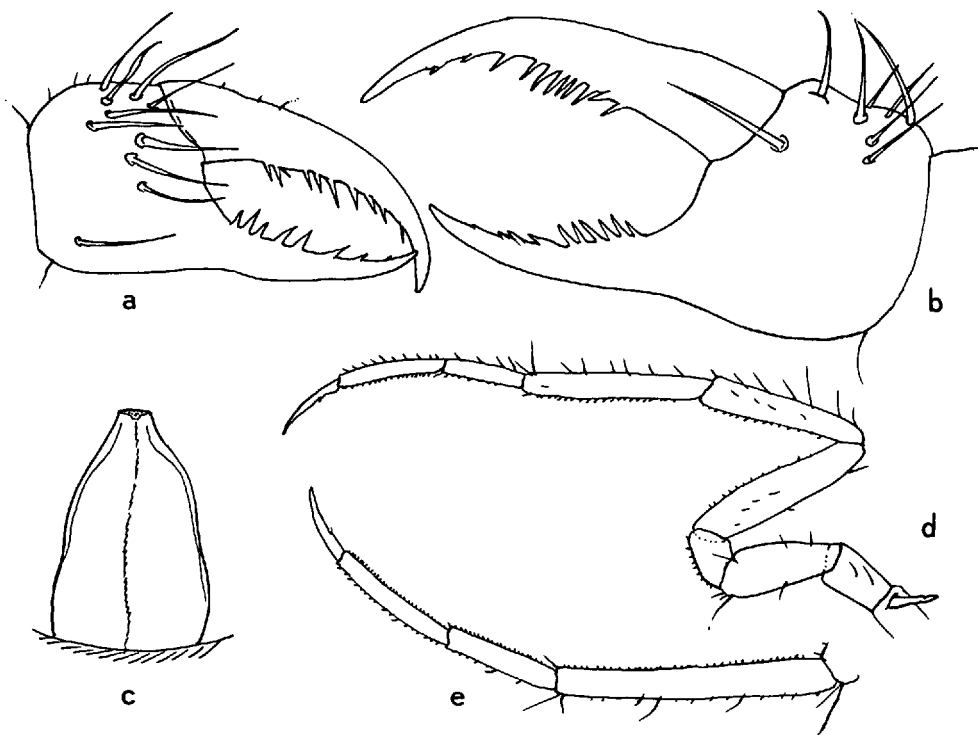


Figure 4. *Paranympyon spinosum* Caullery, 1896 (from the Bay of Biscay): a, chela ♀ (from THALASSA St. 4398); b, chela ♀ (from POLYGAS St. DS 26); c, proboscis ♀, ventral (from THALASSA St. 4398); d, third leg ♀ (from the same station); e, distal segments of third leg ♂ (from BIOGAS VI, St. CP 23a).

Child, 1983: 38). Child (1982a: 18–19) found 3 specimens north of Surinam, thus within the potential range of *P. filarium*, but he noticed no differences with typical North Atlantic specimens.

*Measurements of Holotype (in mm).*—Trunk length (frontal margin cephalic somite to tip 4th lateral process) 1.66; width across 2nd lateral processes 1.52. Third leg: 1st coxa 0.32; 2nd coxa 0.49; 3rd coxa 0.30; femur 1.38; 1st tibia 1.47; 2nd tibia 1.66; tarsus 0.51; propodus 0.57; claw 0.35.

#### Genus *Achelia* Hodge, 1864

This genus is common in very shallow waters in the West Indies (and elsewhere). So, it is not surprising that the present deep-water collections contain only some dubious records.

#### *Achelia sawayai* Marcus, 1940

*A. sawayai*, Krapp and Kraeuter, 1976: 342–343 (refs.); Stock, 1979: 9–10; Child, 1979: 7–8; Child, 1982b: 356–357.

*Material.*—1 ♀; PILLSBURY St. 1214 (S of Jamaica): 17°35.7'N, 77°02.9'W; 22–24 m; 5-VII-1970. 1 ♀; GERDA St. 887 (Yucatan Channel): 21°05'N, 86°28'W; 86–20 fm (157–37 m); 9-IX-1967.

*Remarks.*—I would not be surprised if these two records originate from fouling of the ship's hull; usually *A. sawayai* is found in much shallower waters. The same

GERDA station (887) that yielded *A. sawayai* also contained another shallow-water species, *A. gracilis*, which makes the assumption that fouling organisms were accidentally introduced into the catch even more likely.

*Achelia gracilis* Verrill, 1900

*A. gracilis*, Stock, 1975: 983 (refs.); Stock, 1979: 10.

*Material*.—1 ♂, 1 ♀; GERDA St. 887 (Yucatan Channel): 21°05'N, 86°28'W; 86–20 fm (157–37 m); 9-IX-1967.

*Remarks*.—Presumably originating from fouling (see under *A. sawayai*).

Family COLOSSENDEIDAE

This is a predominantly deep-water family, showing a mixture of plesio- and apomorphous characters. The 10-segmented palp is plesiomorphous, as is the segmented trunk and differentiated proboscis of *Rhopalorhynchus*. The absence of chelifores in adults is an apomorphy. This is one of the families containing extra-legged genera. Since such extra-legged taxa are lacking in the most plesiomorphic family (Ammonotheidae), this might be an apomorphic character. The present collections contain specimens of an extra-legged genus, the rare *Pentacolossendeis*.

Genus *Pentacolossendeis* Hedgpeth, 1943

This is a monospecific genus, known only from 3 Caribbean stations.

*Pentacolossendeis reticulata* Hedgpeth, 1943

*P. reticulata*, Hedgpeth, 1948: 275–276, fig. 51.

*Material*.—1 ♀; PILLSBURY St. 691 (off Guyana): 08°25'N, 58°08'W; 710–705 fm (1,298–1,289 m); 15-VII-1968. 1 ♀; GERDA St. 849 (Straits of Florida): 25°54'N, 79°59'W–25°55'N, 80°00'W; 140 fm (256 m); 2-VIII-1967. 1 ♀; GERDA St. 1028 (Straits of Florida): 24°28.4'N, 81°24.3'W–24°30'N, 81°17.6'W; 135–146 m; 25-II-1969.

*Remarks*.—The female genital pores are located on the ventral surface of coxa 2 of all 5 pairs of legs. The species was previously known from the Bahamas and Florida Keys, 98–110 fm (179–201 m). The present records extend the geographical range to Guyana and the depth range to 1,289 m.

Genus *Colossendeis* Jarzynsky, 1870

Members of this genus are wide-spread, mostly in deeper waters of the world's oceans. Several species are or are presumed to be cosmopolitan. Although many taxonomic problems have been solved in the last two decades, at least the *C. macerrima* complex is still in a mess. Up to now, it was assumed that only one species of this complex occurred in the North Atlantic and Caribbean, *C. macerrima* Wilson, 1881. The present collections contain, however, three recognizable forms of the *macerrima* complex, and specimens from other parts of the world that I re-examined in this context demonstrate that several Pacific records belong to a distinct species, *C. minor* Schimkewitsch, 1893, or to other—so far undescribed—taxa. Most confusing, these taxa do not appear to be restricted to a single deep basin. For instance, *C. leptorhynchus* Hoek, 1881 (only distinguished by one trifling difference from *C. macerrima*) has a large distribution in all three major oceans, including the Caribbean region. At this moment, I feel uncertain whether the small differences observed are of specific, infraspecific, or other nature.

Fortunately, members of the *macerrima* complex belong to the more commonly encountered deep-sea animals, so a revision of the various materials kept in different museums will not be too difficult.

*Colossendeis macerrima* Wilson, 1881

Figure 5e

*C. macerrima*, Stock, 1978b: 400–401, fig. 2m; Child, 1982a: 51; Bamber, 1983: 71; Stock, 1984a: 746.

*Material*.—3 specimens; ISELIN St. 2 (Bahamas): 25°07'N, 77°22'W–25°08'N, 77°18'W; 805 m; I-VII-1972. 1 specimen; ISELIN St. 14 (Bahamas): 23°35'N, 77°11'W–23°33'N, 77°09'W; 1,246 m; 5-VII-1972. 1 specimen; PILLSBURY St. 781 (Caribbean coast of Colombia): 1°30.1'N, 76°26.5'W–1°34.5'N, 73°20.0'W; 310–290 fm (567–530 m); 30-VIII-1968. 1 specimen; PILLSBURY St. 1262 (S of Jamaica): 17°21.4'N, 77°34.8'W; 805–1,089 m; 15-VII-1970.

*Colossendeis leptorhynchus* Hoek, 1881

*C. leptorhynchus* (redescr. of types), Stock 1978b: 462, fig. 2l.

*Material*.—1 specimen; PILLSBURY St. 920 (off Guadeloupe): 16°05.8'N, 61°18.7'W–16°05.5'N, 61°22.1'W; 531–733 m; 12-VII-1969. 1 specimen; PILLSBURY St. 1261 (S of Jamaica): 17°13'N, 77°50'W–17°18'N, 77°50'W; 595–824 m; 15-VII-1970.

*Remarks*.—Except for the greater slenderness of the 7th palp segment, these specimens are very similar to *C. macerrima*.

*Colossendeis gardineri* Carpenter, 1907

Figure 5a–c

*C. gardineri* Carpenter, 1907: 98–99, pl. 13 figs. 20–24; Stock, 1984b, figs. 7–9.

*C. macerrima* p.p., Calman, 1923: 267–268.

*Material*.—1 specimen; PILLSBURY St. 881 (off St. Vincent): 13°20.8'N, 61°02.5'W; 576–842 m; 6-VII-1969.

*Remarks*.—As I pointed out elsewhere, the type specimen (and so far only specimen known) of *C. gardineri* differs in a number of details from *C. macerrima*: the distal three palp segments are elongate, subequal in length, and together longer than segment 7 (in *macerrima*, segments 8 and 9 are less slender, and segments 8 to 10 are together shorter than segment 7). The tarsus of *gardineri* is twice as long as the propodus. The proboscis of *gardineri* is narrower at the tip than at the base, and quite distinctly upturned; in this respect, *gardineri* resembles *C. minor* Schimkewitsch, 1893, a species from the Pacific and Indian Oceans. From both *minor* and *macerrima* it differs by its relatively longer 3rd palp segment, and by the presence of small but distinct spines on tarsus and propodus (instead of really minute spinules); there is also a slight difference between *gardineri* and *minor* in the relative length of the distal three palp segments (Fig. 5b, d).

This is the first record of *C. gardineri* outside the type-locality, Saya de Malha Bank, in the Indian Ocean. Notwithstanding the great geographical separation between the type-locality and the West Indies, I can hardly see any differences at all between the two specimens.

*Colossendeis arcuata* A. Milne Edwards in Filhol, 1885

*C. arcuata*, Stock, 1978b: 403–405, fig. 1g–j (refs., syn.).

*Material*.—2 specimens; ISELIN St. 144 (Bahamas): 24°30.35'N, 77°22.2'W–24°27.8'N, 77°20.25'W; 1,506 m; 3-II-1974. 1 specimen; ISELIN St. 145 (Bahamas): 24°15.6'N, 77°18.76'W–24°13.54'N, 77°18.54'W; 1,447 m; 3-II-1974.

*Remarks.* — The only record from the western Atlantic appears to be that of Hedgpeth, 1948 (as *C. michaelsarsi*) from ALBATROSS St. 2072 (41°53'N, 63°35'W), so the present records extend the range of the species considerably in southward direction.

### *Colossendeis colossea* Wilson, 1881

*Synonymy.* — Bouvier, 1917 and Hedgpeth, 1948.

*Material.* — 1 specimen; ISELIN St. 75 (Bahamas): 24°14'N, 76°06'W–24°18'N, 76°06'W; 1,737 m; 5-III-1973. 1 specimen; ISELIN St. 78 (Bahamas): 24°25'N, 76°10'W–24°25'N, 76°08'W; 1,701 m; 6-III-1973. 1 juv.; ISELIN St. 145 (Bahamas): 24°15.6'N, 77°18.76'W–24°13.54'N, 77°18.54'W; 1,447 m; 3-II-1977. 2 specimens; ISELIN St. 175 (Bahamas): 24°31.5'N, 76°17.9'W–24°30.25'N, 76°19.6'W; 1,701 m; 9–10-II-1974. 1 specimen; ISELIN St. 178 (Bahamas): 24°13.4'N, 76°06'W–24°11.3'N, 76°05'W; 1,790 m; 10-II-1974. 1 juv.; ISELIN St. 182 (Bahamas): 23°56'N, 75°58'W–23°57'N, 75°58.2'W; 1,758 m; 11-II-1974. 1 specimen; ISELIN St. 186 (Bahamas): 23°45.2'N, 75°41.6'W–23°45.3'N, 75°42.9'W; 1,853 m; 12-II-1974. 1 specimen; ISELIN St. 187 (Bahamas): 23°59.5'N, 75°49'W–24°03'N, 75°47.5'W; 1,880 m; 12-II-1974. 1 specimen; ISELIN St. 192 (Bahamas): 24°20.9'N, 75°59.4'W–24°20.8'N, 76°01.0'W; 1,760 m; 13-II-1974. 3 specimens; PILLSBURY St. 689 (off Guyana): 08°14.0'N, 57°38'W; 750–790 fm (1,372–1,445 m); 15-VII-1967. 2 specimens; PILLSBURY St. 748 (off Caracas, Venezuela): 11°24.8'N, 67°10.1'W–11°36'N, 67°06'W; 1,020–975 fm (1,865–1,783 m); 25-VII-1968. 8 specimens; PILLSBURY St. 844 (N of Tobago): 11°30'N, 60°14.5'W; depth not recorded; 1-VII-1969. 1 specimen; PILLSBURY St. 846 (N of Tobago): 11°37.8'N, 60°37.4'W–11°38.8'N, 60°37.5'W; 659–1,125 m; 2-VII-1969. 2 specimens; PILLSBURY St. 847 (N of Tobago): 11°37.3'N, 60°59.4'W–11°41'N, 61°01.3'W; 733–1,281 m; 2-VII-1969. 1 specimen; PILLSBURY St. 1197 (between Jamaica and Hispaniola): 17°33.5'N, 76°08.5'W–17°35'N, 75°58'W; 1,482–1,504 m; 3-VII-1970. 1 specimen; PILLSBURY St. 1441 (Bahamas): 22°25.1'N, 73°52.0'W; 855 m; 23-VII-1971. 1 specimen; GERDA St. 965 (Straits of Florida): 23°45'N, 81°49'W; 765–762 fm (1,399–1,394 m); 1-II-1968. 4 specimens; GILLISS St. 38 (Colombia): 12°03'N, 74°15'W–12°01'N, 73°38'W; 1,554–1,865 m; 2-VIII-1972.

*Remarks.* — This is a large and easily recognizable deep-water species, taken in all major ocean basins.

## Family NYMPHONIDAE

This family is characterized by the presence, in both sexes, of chelate chelifores, 5- (or rarely 4-)segmented palpi and 10-segmented ovigers (oviger claw present or absent). The family occupies an intermediate position between the Ammonotheidae (especially *Paranymphon*) and the Callipallenidae.

### Genus *Nymphon* Fabricius, 1794

This is the largest genus of the Pycnogonida (>180 species, see Child, 1982a: 38), especially prolific in cold waters of the boreal-arctics of both the northern and southern hemisphere and in the deep sea. Gradually, however, more and more tropical species become known, but in the littoral and sublittoral zones of the Caribbean, this genus is not rich in species. Besides three species previously recorded from this region, I add a new species collected by the PILLSBURY cruises.

### *Nymphon aemulum* Stock, 1975

*N. aemulum* Stock, 1975: 998–1001, figs. 16–17.

*Material.* — 1 ♀; PILLSBURY St. 938 (E of Guadeloupe): 16°13'N, 61°09'W; 33–37 m; 16-VII-1969.

*Remarks.* — Although *N. aemulum* usually is found in very shallow waters (medio- and upper sublittoral), it occasionally is recorded from deeper waters as well, as is evidenced by the above PILLSBURY record.

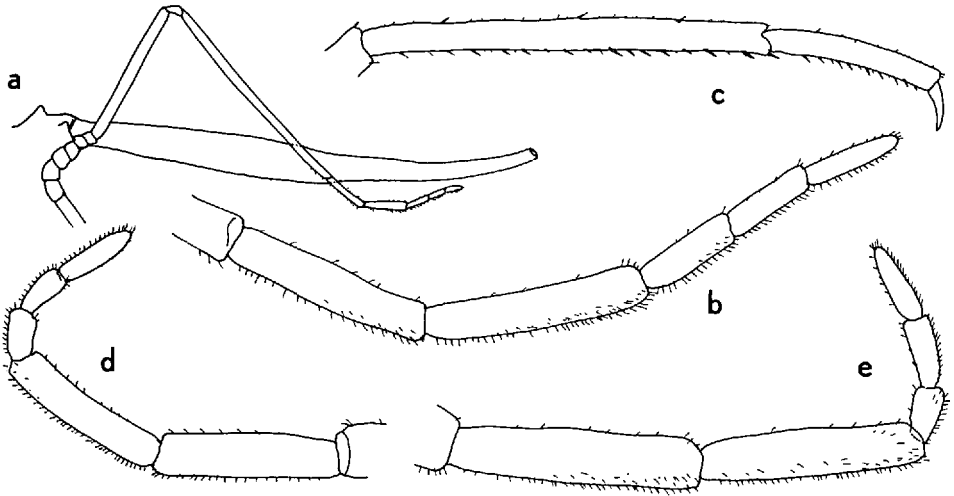


Figure 5. *Colossendeis macerrima*-group: a, *C. gardineri* Carpenter, 1907, proboscis and palp, from the right (from PILLSBURY St. 881); b, distal palp segments of same; c, distal segments of leg 1 of same. d, *C. minor* Schimkewitsch, 1893 (from GILLISS St. 3), distal palp segments. e, *C. macerrima* Wilson, 1881 (from GERDA St. 475), distal palp segments.

### *Nymphon floridanum* Hedgpeth, 1948

*N. floridanum*, Child, 1982b: 374 (refs.).

**Material.**—1 ♂; GERDA St. 533 (off Grand Bahama): 26°27'N, 78°43'W–26°28'N, 78°45'W; 210–220 fm (384–402 m); 4–III-1965. 1 ♀; GERDA St. 887 (Yucatan Channel): 21°05'N, 86°28'W; 86–20 fm (157–37 m); 9–IX-1967.

**Remarks.**—This is a sublittoral species known from depths between 1 and almost 60 m (Child, 1979: 37). One of the present records extends the bathymetrical range to 402 m. This deep-water specimen has 30 teeth on the chela, thus a larger number than the hitherto recorded 15 to 19 teeth.

### *Nymphon macrum* Wilson, 1880

*N. macrum*, Hedgpeth, 1948: 193 (refs.); Child, 1982a: 43–44 (refs.).

**Material.**—1 ♀; GERDA St. 849 (Straits of Florida): 25°54'N, 79°59'W–25°55'N, 80°00'W; 140 fm (256 m); 2–VIII-1967.

**Remarks.**—This is a predominantly northern species, which extends to Florida and Cuba (Hedgpeth, 1948).

### *Nymphon vulsum* new species

Figure 6b–j

**Material.**—1 ♀ (holotype); PILLSBURY St. 721 (Isla de Margarita, Venezuela): 11°06.5'N, 64°22.5'W–11°07'N, 64°23.4'W; 14–15 fm (26–27 m); 21–VII-1968.

**Description.**—Trunk slender, hairless; neck very long. Oviger implantation in contact with first lateral process. Lateral processes twice as long as wide, separated by intervals that are up to twice as large as diameter of lateral process. Abdomen short, not reaching beyond 4th lateral processes. Ocular tubercle rather low, rounded; eyes swollen, pale in preserved state.

Proboscis cylindrical in basal half; slightly barrel-shaped in distal half.

Scape practically unarmed. Chela slender, curved. Movable finger with about 27, immovable finger with about 25 teeth of more or less regular size. Both fingers with pointed tip.

Palp segment 2 longest. Segments 1 to 3 almost unarmed; segment 3 longer than 4; 4 and 5 of equal length, both armed with some short setules.

Oviger as illustrated; short setules on segments 5, 8, 9, and 10. Compound spine formula 15:15:15:13; each spine lanceolate, with 6 to 7 pairs of lateral teeth of uniform size. Terminal claw with 9 regular teeth.

Legs slender; genital pores (♀) on all legs; no coxal spurs. Dorsal margin of leg segments provided with minute, curved setules; no long setae or spines. Tibia 2 longest segment. Tarsus somewhat shorter than propodus. Propodus without heel; sole with over 30 minute spinules of uniform size. Claw long, slender; auxiliary claws less than  $\frac{1}{2}$  of main claw.

*Measurements of Holotype (in mm).*—Trunk length (frontal margin cephalic somite to tip 4th lateral process) 5.29; length cephalic somite 2.26; length 2nd trunk somite 0.87; length 3rd trunk somite 0.93; length 4th trunk somite (to tip 4th lateral process) 1.23; width across 2nd lateral processes 2.58; length proboscis (ventral) 1.39; greatest diameter proboscis 0.61; length scape 1.17; length chela 1.78. Third leg: 1st coxa 0.95; 2nd coxa 2.00; 3rd coxa 1.03; femur 4.47; 1st tibia 5.16; 2nd tibia 6.14; tarsus 1.49; propodus 1.64; claw 1.33; auxiliary claws 0.19.

*Remarks.*—None of the species recorded from the North or South American Atlantic or the Caribbean can be confused with the present one. The closest resemblance is to certain West African species, like *N. adami* Giltay, 1937, and especially to *N. foresti* Fage, 1953.

It differs from *N. adami* in having shorter lateral processes, more numerous compound oviger spines (58 versus 33–36), teeth of uniform size on the dactyli of the chela, etc.

From *N. foresti* it differs by the lower number of teeth on the dactyli of the chela (25–27 versus 45), by the higher number of compound oviger spines (58 versus 38), by the 2nd tibia which is markedly longer than the first, and by the more numerous spinules on the propodal sole (over 30 versus 8 to 9). Details about the chelar dentition, the shape of the oviger spines, the number of teeth on the oviger claw, etc. are not described for *N. foresti*, but may furnish additional differences.

*Etymology.*—The specific name, *vulsum* (from Pliny, meaning hairless), alludes to the complete absence of longer setae on body and legs.

### *Nymphon surinamense* Stock, 1975

*N. surinamense* Stock, 1975: 1007–1010, figs. 21 and 22.

*Material.*—1 ♂ ovig.; PILLSBURY St. 687 (off Guyana): 07°13'N, 57°36'W; 27 m; 15-VII-1968. 1 ♀; PILLSBURY St. 721 (off Margarita, Venezuela): 11°06.5'N, 64°22.5'W–11°07'N, 64°23.4'W; 14–15 fm (26–27 m); 21-VII-1968. 1 ♀; PILLSBURY St. 722 (off Margarita, Venezuela): 11°04'N, 64°44'W–11°05.2'N, 64°45'W; 50 fm (91 m); 21-VII-1968.

*Remarks.*—An uniungiculate species from the upper part of the continental shelf of the northern coast of South America, from the Guyanas to Margarita.

### Genus *Neonymphon* Stock, 1955

A North Atlantic deep-water genus with apomorphic (4-segmented) palps. The genus contains a single named species, hitherto only known from the type-

locality, but found again during the PILLSBURY cruises. An unnamed form was recorded from the Bay of Biscay (Stock, 1978a).

*Neonymphon caecum* Stock, 1955

Figure 6a

*N. caecum* Stock, 1955: 219–223, figs. 2–3.

*Material.* — 1 ♀; PILLSBURY St. 675 (off Surinam): 08°26'N, 54°17'W–08°41'N, 54°19'W; 675–695 fm (1,234–1,271 m); 12-VII-1968.

*Remarks.* — Previously recorded only once, in about 500 fm (914 m) west of St. Croix (U.S. Virgin Islands). The femur of the single female in the present collection is strongly swollen in its basal two-thirds and contains the ripening ovaria (Fig. 6a).

Family CALLIPALLENIDAE

This family is mainly characterized by the apomorphic condition of the palp, which is lacking or vestigial in females, but may be present (1- to 4-segmented) in males. The genus *Neonymphon* forms, by its 4-segmented palpi, a bridge from the Nymphonidae to the Callipallenidae, but in *Neonymphon* the palps are still present in both sexes.

Genus *Parapallene* Carpenter, 1892

This genus is predominantly Indo-West Pacific in its distribution: 17 species have been recorded from that region. Only one species has been found so far outside the Indo-West Pacific, viz. *P. bermudensis* Lebour, 1949, from shallow waters in Bermuda. During the GERDA cruises a second West Indian species was found, this time in deep waters. It is the first deep-water member of the genus ever recorded.

*Parapallene parviungicularis* new species

Figure 7

*Material.* — 1 ♀ (holotype); GERDA St. 1107 (Straits of Florida): 24°05'N, 81°20'W; 851–933 m; 29–30-IV-1969.

*Description.* — Trunk slender, unarmed. Lateral processes longer than diameter of trunk, separated by large intervals, unarmed. Abdomen short. Neck very narrow in basal part, strongly widened distally. Neck with segmental fold in front of oviger implantations. Oviger implantations just free of first pair of lateral processes. Ocular tubercle low, truncate; eyes present, rounded, but (in preserved state) unpigmented. Proboscis cylindrical in basal part, widened and slightly angular distally. Lips sclerotized; mouth with fringe of minute setules. Scape with several long, medially directed, setae. Palm globular; fingers short, vaguely crenulated. No palps.

Oviger 10-segmented; segments 4 and 5 very elongate; segment 6 much longer than 7. Distal claw very small, half as long as compound oviger spines, unarmed. Compound spines with 1 or 2 pairs of basal teeth and finely ciliated, leaf-like, distal part; spine formula 13:11:10:13. Legs very slender; armed with short setae only; femur swollen in basal half; tibia 2 by far longest segment. Tarsus short. Propodus slender, with 3 unadorned heel spines and row of densely packed, numerous, sole spinules. Claw strong, outer half more strongly sclerotized than inner margin. Auxiliary claws thin, less than 1/3 of main claw.

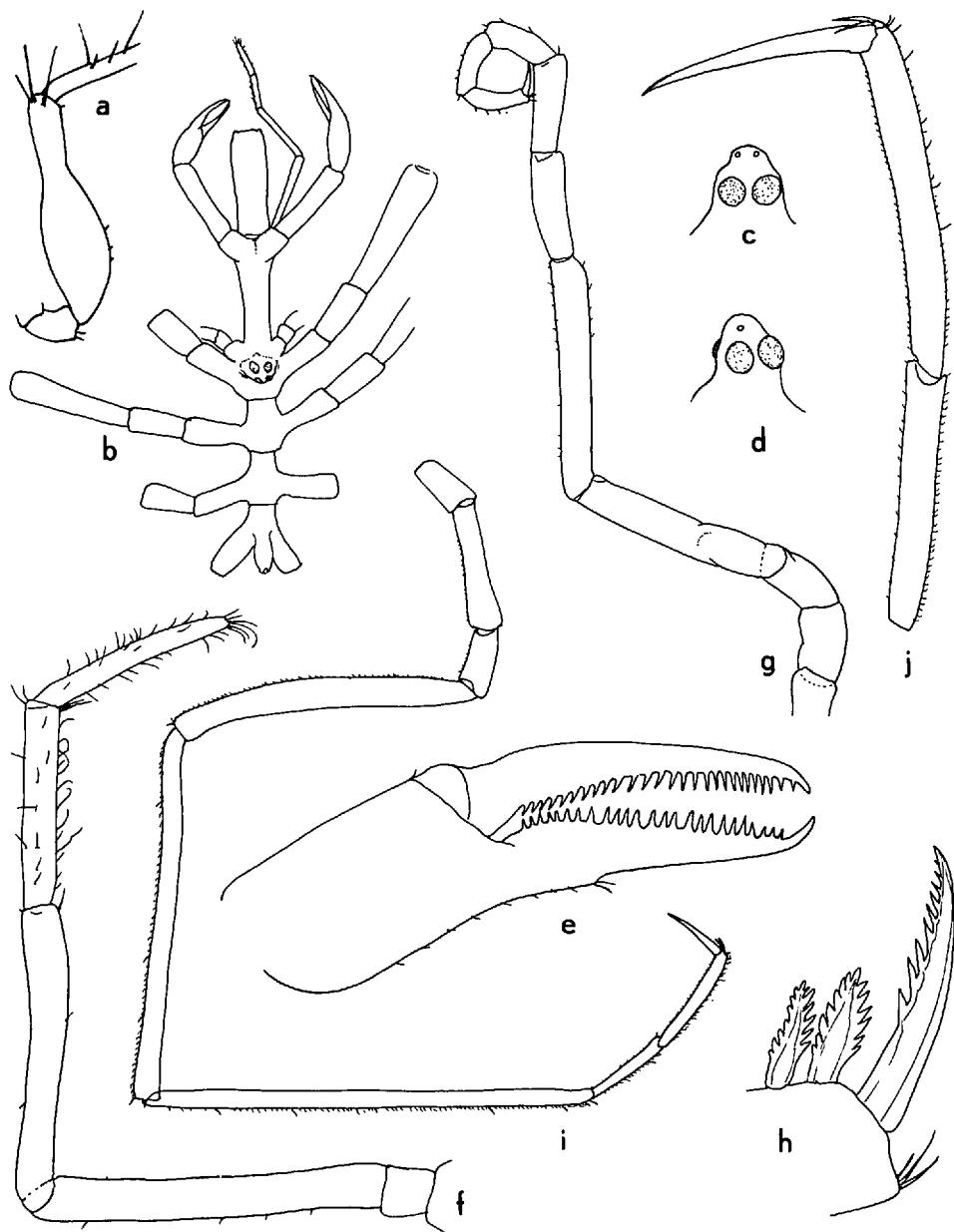


Figure 6. a, *Neonymphon caecum* Stock, 1955 (from PILLSBURY St. 675), femur of third leg, ♀; b-j, *Nymphon vulsum* new species, ♀ holotype: b, body, dorsal; c, ocular tubercle, frontal; d, ocular tubercle, from the right; e, chela; f, palp; g, oviger (compound spines omitted); h, distal part of oviger; i, first leg; j, distal segments of first leg.

*Measurements of Holotype (in mm).*—Neck length (to pre-ocular fold) 1.72; pre-ocular fold to posterior margin of 1st trunk somite 0.87; length 2nd trunk somite 0.67; length 3rd trunk somite 0.54; length 4th trunk somite (to tip abdomen) 0.54; width across 2nd lateral processes 1.36; diameter crop 0.52; length proboscis (ventral) 1.17; greatest diameter proboscis 0.70; length scape 0.84; length chela



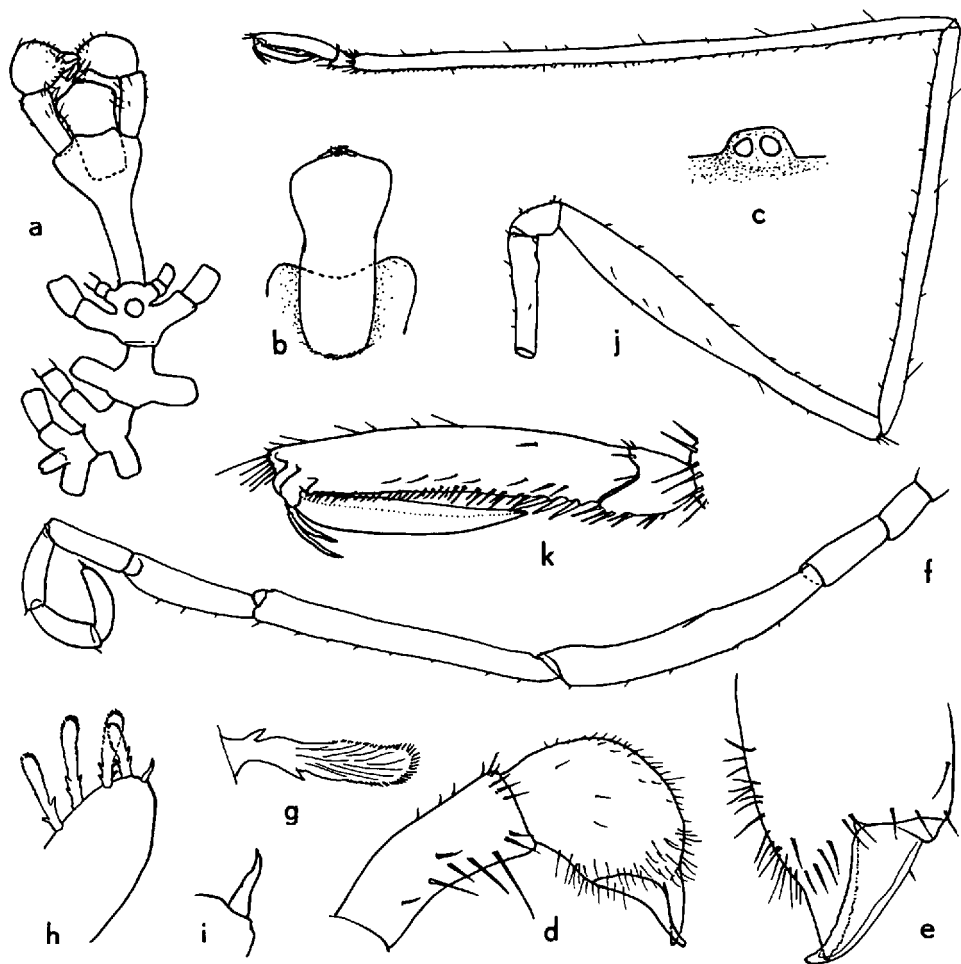


Figure 7. *Parapallene parviunguicularis* new species, ♀ holotype: a, body, dorsal; b, proboscis, ventral; c, ocular tubercle, from the right; d, chelifore; e, chela; f, oviger (compound spines omitted); g, compound oviger spine; h, distal part of oviger; i, oviger claw; j, first leg; k, distal segments of first leg.

0.97. First leg: 1st coxa 0.46; 2nd coxa 1.47; 3rd coxa 0.46; femur 4.27; 1st tibia 4.55; 2nd tibia 6.68; tarsus 0.13; propodus 0.98; claw 0.67; auxiliary claws 0.19.

**Remarks.**—The only other West Indian taxon, *P. bermudensis*, is markedly different from the new species in having a much less slender propodus, a propodal sole with only a reduced number (<5) spinules, much longer auxiliaries, a pointed ocular tubercle, and a long terminal oviger claw.

Nevertheless, *P. bermudensis* closely resembles in two respects the new species, viz. in combining the presence of auxiliary claws with a very long neck. The remaining species in the genus possessing auxiliary claws either have a medium-long neck (*challengeri* Calman, 1937) or a short neck (*aculeata* Stock, 1954, and *echinata* Calman, 1938). All other species of *Parapallene* are devoid of auxiliary claws.

This is the first record of a *Parapallene* from deep waters; the 18 species previously described are all from the continental shelf (less than about 200 m).

*Etymology.*—The strong reduction of the terminal oviger claw has inspired the specific name, *parviungicularis*.

### Genus *Pallenoides* Stock, 1951

Of the two species known from the tropical western Atlantic, only one is represented in these collections.

#### *Pallenoides spinulosa* Stock, 1955

*P. spinulosa* Stock, 1955: 227–230, figs. 6–7; Capriles, 1970: 105; Stock, 1975: 1012.

*Material.*—1 ♂ ovig.; PILLSBURY St. 595 (Yucatan Channel): 21°08.5'N, 86°27'W; 18–320 fm (33–585 m); 15-III-1968. 2 ♂, 2 ♀, 3 juvs.; GERDA St. 887 (Yucatan Channel): 21°05'N, 86°28'W; 86–20 fm (157–37 m); 9-IX-1967.

*Remarks.*—Previously recorded from one station in U.S. Virgin Islands, 15–20 fm (27–37 m), and from a shallow-water station in Puerto Rico.

### Genus *Callipallene* Flynn, 1929

A large and uneasy genus, of which the species are distinguished by rather refined characters only. A great amount of variability, especially in the slenderness of body and appendages, supposedly related with growth stages.

#### *Callipallene brevirostris* (Johnston, 1837)

*C. brevirostris brevirostris*, Stock, 1952: 5–6 (refs.).

*C. brevirostrum*, Stock, 1975: 1010–1011.

*C. brevirostris*, Stock, 1979: 14.

*Material.*—1 ♂; GERDA St. 888 (Yucatan Channel): 21°00'N, 86°29'W; 14 fm (26 m); 10-IX-1967.

*Remarks.*—I attribute this solitary specimen with some hesitation to *C. brevirostris*, in the light of the great variability exhibited by the members of this genus.

#### *Callipallene longicoxa* Stock, 1955 (new rank)

*C. brevirostris longicoxa* Stock, 1955: 223–226, figs. 4–5.

*Material.*—1 ♀; GERDA St. 715 (Straits of Florida): 26°04'N, 79°24'W–26°05'N, 79°24'W; 300–280 fm (549–512 m); 2-VIII-1965.

*Remarks.*—I have given up subspecific distinctions within *C. brevirostris*, since my original idea (1952) that bathymetrical races were involved proved to be invalid. So, I have raised the present taxon to specific rank. It has been recorded only once previously, from the U.S. Virgin Islands, 13–20 fm (24–37 m).

*Callipallene belizae* Child, 1982b, is so close morphologically that it may be synonymous with *C. longicoxa*.

### Family PHOXICHILIDIIDAE

In this family, I unite those genera in which the palps are reduced (in both sexes) to 1-segmented vestiges or are absent. The ovigers are in various degrees of reduction; in females they have lost their cleaning function, although in some genera they are still 10-segmented (*Pallenopsis*). The number of segments in female ovigers may vary between 10 and 0; at any rate, compound spines are absent in both sexes. The ocular tubercle is always near the frontal margin of the cephalic somite. Fully chelate chelifores are usually present in adults, but in one genus

they are only present in juveniles or in neotenic adults (*Endeis*). Cement glands are more conspicuous than in most Nymphonidae or Callipallenidae.

### Genus *Pallenopsis* Wilson, 1881

The Atlantic coasts of the Americas are very rich in species of this difficult genus. Even within the Caribbean, there are several species. In this sequel, I try to describe the morphological differentiation as clearly as possible, but I must admit that several enigmas remain in existence. Certain characters, usually considered "good" taxonomic characters, tend to vary (setation of the legs; length of the cement gland duct; number of oviger segments in the female), and the significance of such "variations" escapes me.

The genus *Pallenopsis* can be divided in two subgenera (Stock, 1975), both represented in the present collections.

### *Pallenopsis (Pallenopsis) forficifera* Wilson, 1881

*P. forcifer*, Stock, 1975: 1030–1032, fig. 30a–b.

**Material.** — 1 ♀; PILLSBURY St. 197 (N of Grand Bahama): 27°59'N, 79°20'W; 320–310 fm (585–567 m); 11-VIII-1964. 1 ♂, 1 ♀; PILLSBURY St. 781 (Caribbean coast of Colombia): 11°30.1'N, 76°26.5'W–11°34.5'N, 73°20.0'W; 310–290 fm (567–530 m); 30-VII-1968. 1 ♂, 1 ♂ fragm.; PILLSBURY St. 881 (St. Vincent): 13°20.8'N, 61°02.5'W; 576–842 fm (1,053–1,540 m); 6-VII-1969. 1 ♀; PILLSBURY St. 1187 (W of Haiti): 18°17'N, 75°07'W; 1,034 m; 2-VII-1970. 2 ♀; PILLSBURY St. 1306 (Straits of Florida): 25°44.5'N, 79°50.0'W; 302–366 m; 4-XII-1970. 1 ♀; PILLSBURY St. 1309 (Straits of Florida): 25°44.5'N, 79°50.0'W; 310 m; 5-XII-1970. 1 ♀; GERDA St. 15 (Straits of Florida): 25°45'N, 80°00'W; 275–302 m; 30-V-1962. 1 ♀; GERDA St. 830 (Straits of Florida): 25°40'N, 79°59'W–25°43'N, 79°59'W; 187 fm (342 m); 7-VII-1967. 1 ♀; GERDA St. 840 (Straits of Florida): 24°24'N, 80°41'W; 296–289 m; 11-VII-1967. 3 ♀; GERDA St. 849 (Straits of Florida): 25°54'N, 79°59'W–25°55'N, 80°00'W; 140 fm (256 m); 2-VIII-1967. 1 ♂; GERDA St. 977 (Straits of Florida): 24°32'N, 81°08'W; 100 fm (183 m); 3-II-1968. 1 ♂; GERDA St. 998 (off Palm Beach, Fla.): 27°10'N, 79°43'W; 200–205 fm (366–375 m); 21-V-1968. 1 ♀; GERDA St. 1107 (Straits of Florida): 24°05'N, 81°20'W; 851–933 m; 29-IV-1969. 1 ♂; GERDA St. 1347 (off Miami): 25°50'N, 79°58'W; 275–269 m; 1-III-1972.

**Remarks.** — This is a species from deeper waters (usually about 200–600 m) south of Cape Hatteras. Two Caribbean records (off St. Vincent and off Haiti) in the above list are from considerably deeper waters (over 1,000 m).

I have corrected the spelling of the specific name (hitherto the male ending, *forcifer*, has been used), to match with the feminine gender of the generic name.

### *Pallenopsis (Pallenopsis) schmitti* Hedgpeth, 1943

Figure 8g–i

*P. (P.) schmitti*, Stock, 1975: 1028, fig. 30c–d (refs.); Child, 1979: 46.

**Material.** — 1 ♂; PILLSBURY St. 572: ½ mi S of Bridge of Americas, Balboa, Canal Zone; shore collection; 14-V-1967. 2 ♀; PILLSBURY St. 650 (off French Guiana): 06°07'N, 52°19'W; 46–50 fm (84–91 m); 8-VII-1968. 3 ♂, 2 ♀; PILLSBURY St. 736 (Venezuela): 10°57'N, 65°52'W–11°03'N, 65°55'W; 38–85 fm (69–155 m); 2-VII-1968. 1 juv.; PILLSBURY St. 1149 (N of Hispaniola): 19°58.7'N, 71°33.7'W–19°59.2'N, 71°33.5'W; 22–33 m; 15-I-1970.

**Remarks.** — Although PILLSBURY St. 572 is not an Atlantic station, it is enumerated here since it represents the first and only record of *P. schmitti* in the Pacific.

This species belongs to a group of taxa characterized by the presence of long setae on the legs, in particular on the first tibia. However, during the present study several look-alikes have been recognized (*P. kempi* Stock, 1975; *P. childi* new species; *P. varioculata* new species, *P. mixta* new species). I am afraid that many of the older records need critical re-examination in order to verify the identifications.

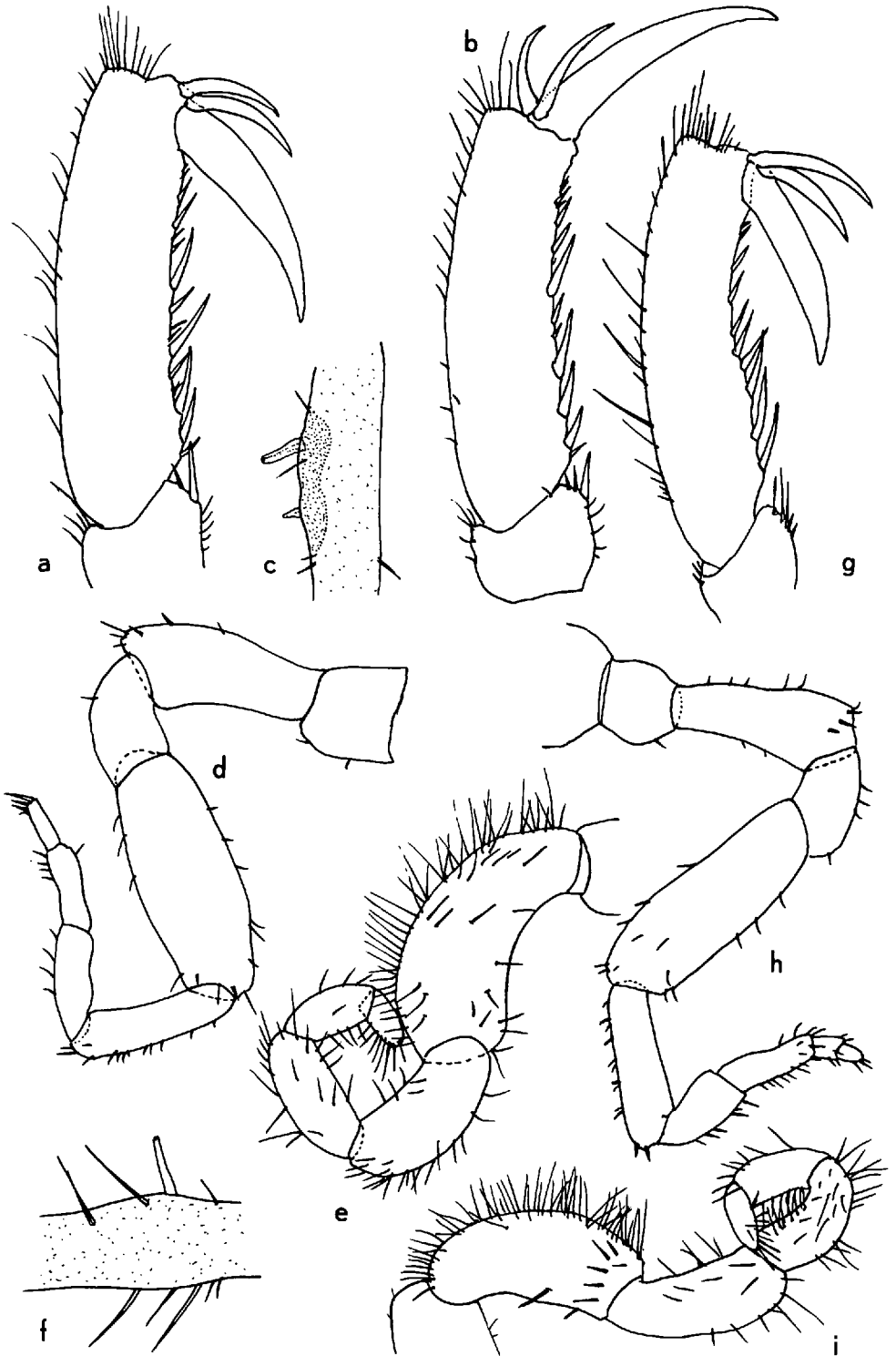


Figure 8. *Pallenopsis* (*Pallenopsis*) *schmitti* Hedgpeth, 1943 (g–i) and *P. (P.) kempfi* Stock, 1975 (a–f): a, distal segments of second leg, ♀ (PILLSBURY St. 736); b, distal segments of first leg, ♀ (same station);

In my 1975 paper, I mentioned three characters by which *P. schmitti* and *P. kempfi* can be segregated: the length of the auxiliary claws (longer in *schmitti*), the length of the cement gland tube (longer in *schmitti*), and the length of the propodus (less slender in *schmitti*). The present, rich material has convinced me that only the first character is a valid one. The degree of slenderness of the propodus can vary both in *schmitti* and in *kempfi* to such a degree that overlap is frequent. Moreover, four PILLSBURY stations yielded specimens of *P. kempfi* in which the cement gland duct was longer than normal, making this character also unreliable (vide infra). The two species show, however, slight but consistent characters in the oviger, not mentioned earlier. In *P. schmitti*, oviger segment 6 (♀) is shorter than segment 7 (Fig. 8h), whereas in *P. kempfi*, segment 6 is as long as or even longer than segment 7. In the male oviger, the differences are less pronounced, but in *P. kempfi* segment 7 is relatively shorter in comparison with segment 6 than in *P. schmitti* (Fig. 8e, i). A very useful additional character, easy to observe, that segregates the two species is the relative length of the 2nd tibia. In *P. schmitti* it is distinctly longer than the femur, in *P. kempfi* it is about as long as the femur.

The armature of the propodus, although variable, tends to be more regular in *schmitti* than in *kempfi*; in the latter, larger spines are often alternated with smaller spines (Fig. 8a, b, and g).

*Pallenopsis (Pallenopsis) kempfi* Stock, 1975

Figure 8a-f

*P. (P.) kempfi* Stock, 1975: 1025-1028, figs. 28-29.

**Material.**—3 ♀; PILLSBURY St. 574 (off Honduras): 16°16'N, 82°26.5'W-16°18'N, 82°27'W; 37 m; 20-V-1967. (Erroneously recorded as *P. schmitti* by Stock, 1975: 1028.) 1 ♀; PILLSBURY St. 655 (off Guiana): 06°07'N, 53°39'W-06°07'N, 53°41'W; 14 fm (26 m); 2-VII-1968. 1 ♂; PILLSBURY St. 686 (off Guyana): 07°00'N, 57°08'W; 15-14 fm (27-26 m); 15-VII-1968. 2 ♂; PILLSBURY St. 687 (off Guyana): 07°13'N, 57°36'W; 27 m; 15-VII-1968. 3 ♂, 1 juv.; PILLSBURY St. 707 (E of Isla de Margarita): 11°21'N, 62°21'W-11°23.5'N, 62°23'W; 43 fm (79 m); 19-VII-1968. 2 ♂, 2 ♀; PILLSBURY St. 708 (E of Isla de Margarita): 11°24.7'N, 62°40.5'W-11°26.6'N, 62°40.5'W; 39-40 fm (71-73 m); 19-VII-1968. 9 ♀, 3 ♂; PILLSBURY St. 721 (off Margarita, Venezuela): 11°06.5'N, 64°22.5'W-11°07'N, 64°23.4'W; 14-15 fm (26-27 m); 21-VII-1968. 2 ♂, 2 ♀; PILLSBURY St. 722 (off Margarita, Venezuela): 11°04'N, 64°44'W-11°05.2'N, 64°45'W; 50 fm (91 m); 21-VII-1968. 1 juv.; PILLSBURY St. 723 (S of Isla de Margarita): 11°43.5'N, 64°16'W-10°45.5'N, 64°15'W; 39-33 fm (71-60 m); 21-VII-1968. 3 ♂, 1 juv.; PILLSBURY St. 728 (Venezuela): 10°22.5'N, 65°23'W-10°25.7'N, 65°21.6'W; 47 fm (86 m); 21-VII-1968. 1 ♂; PILLSBURY St. 734 (W of Isla de Margarita): 11°04.8'N, 65°34.2'W-11°01.0'N, 65°36.3'W; 37-33 fm (68-60 m); 22-VII-1968. 1 ♂, 2 ♀; PILLSBURY St. 736 (Venezuela): 10°57'N, 65°52'W-11°03'N, 65°55'W; 38-85 fm (69-155 m); 22-VII-1968. 2 ♂, 1 ♀; PILLSBURY St. 737 (Venezuela): 10°44'N, 66°07'W-10°45'N, 66°08'W; 33-40 fm (60-73 m); 22-VII-1968. 1 ♀; PILLSBURY St. 749 (S of Bonaire Trench): 10°37.0'N, 67°57.9'W-10°43.3'N, 67°57.9'W; 32 fm (59 m); 25-VII-1968. 1 ♂, 2 ♀; PILLSBURY St. 750 (off Caracas, Venezuela): 10°36.1'N, 68°12.2'W-10°37.3'N, 68°11.4'W; 12-14 fm (22-26 m); 25-VII-1968. 2 ♀; PILLSBURY St. 758 (off Coro, Venezuela): 11°42.2'N, 69°40.0'W-11°44.0'N, 69°40.0'W; 8-10 fm (15-18 m); 27-VII-1968. 2 ♀; PILLSBURY St. 773 (off Maracaibo, Venezuela): 12°17.0'N, 72°15.0'W-12°18.0'N, 72°13.8'W; 33-35 fm (60-64 m); 29-VII-1968. 3 ♀; PILLSBURY St. 775 (Atlantic coast Colombia): 12°05'N, 72°38.5'W-12°06'N, 72°37'W; 223-315 fm (408-576 m); 29-VII-1968. 1 ♂; PILLSBURY St. 792 (Atlantic coast Colombia): 10°50'N, 75°22'W-10°49.9'N, 75°23.6'W; 6-7 fm (11-13 m); 1-VIII-1968. 1 ♂; PILLSBURY St. 1324 (Atlantic coast of Costa Rica): 10°28.8'N, 83°20.5'W; 55 m; 26-I-1971. 1 ♀; PILLSBURY St. 1335 (Atlantic coast Nicaragua): 12°28.9'N, 83°04.8'W; 27 m; 28-I-1971. 1 ♀; GERDA St. 1032 (Straits of Florida): 24°36.2'N, 81°06.1'W; 46 m; 26-II-1969. 2 ♀, 1 juv.; GERDA St. 1033 (Straits of Florida): 24°36.2'N, 81°06.5'W-24°36.6'N, 81°05.8'W; 42 m; 26-II-1969.

c, cement gland of an aberrant type (two ducts, see text) (PILLSBURY St. 722); d, oviger ♀ (PILLSBURY St. 736); e, distal segments of oviger ♂ (same station); f, cement gland duct of an aberrant type (longer and more slender, see text) (PILLSBURY St. 708); g, distal segments of first leg, ♀ (PILLSBURY St. 736); h, oviger ♀ (same station); i, distal oviger segments ♂ (same station).

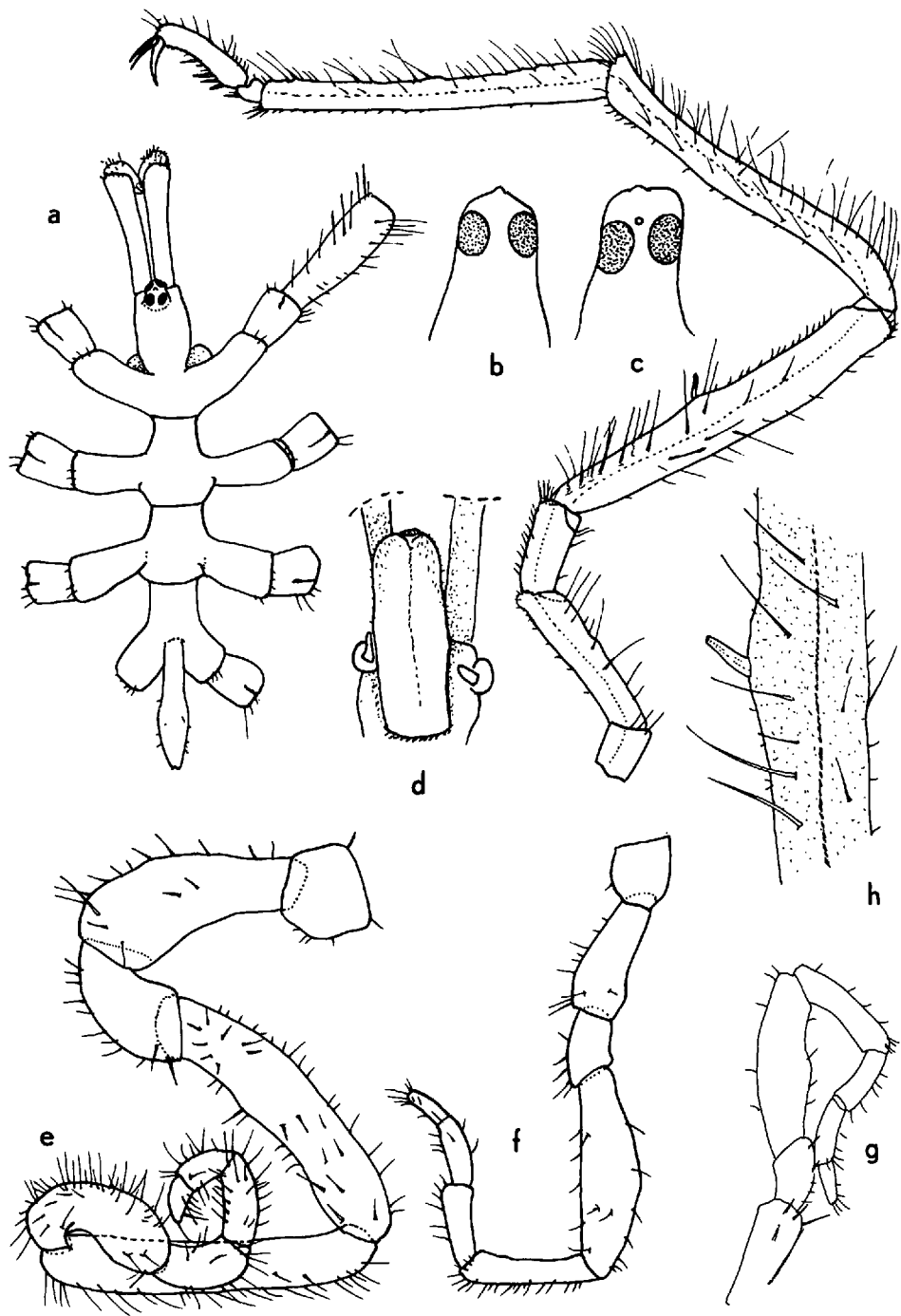


Figure 9. *Pallenopsis (Pallenopsis) childi* new species (from GERDA St. 1037): a, body ♂, dorsal; b, ocular tubercle ♂, frontal; c, ocular tubercle ♂, from the left; d, proboscis, ventral (of an aberrant ♂ with 2-segmented palps, see text); e, oviger ♂; f, g, oviger ♀; h, cement gland duct ♂.

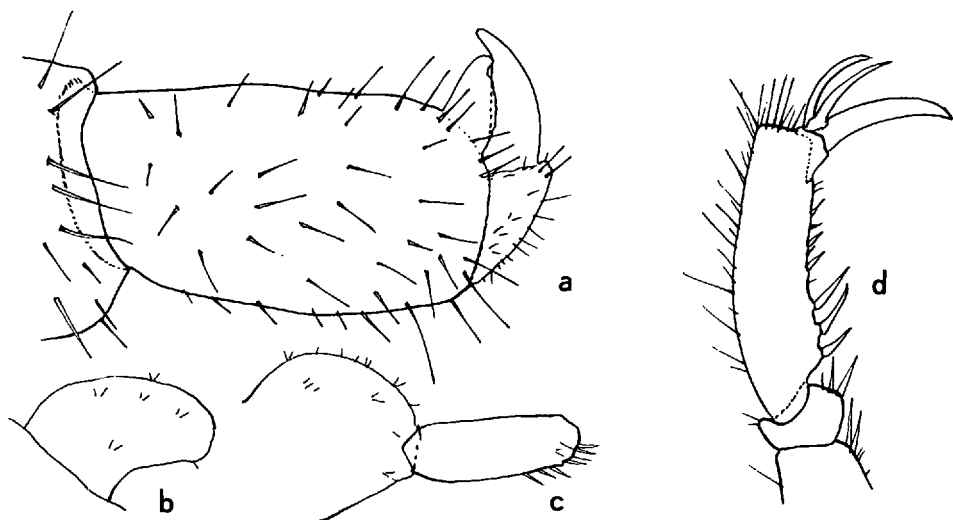


Figure 10. *Pallenopsis (Pallenopsis) childi* new species (from GERDA St. 1037): a, chela ♂; b, normal male palp; c, aberrant (2-segmented) male palp; d, distal segments of second leg, ♂.

**Remarks.**—Whereas *P. schmitti* tends to be more common in the northern half of the Caribbean and in Florida, *P. kempfi* is more abundant along the coasts of northern South America and Central America. However, the ranges of both overlap.

The specimens from PILLSBURY Stations 707, 708, 734, and 736 have a slightly more elongate and slender cement gland duct than usual (Fig. 8f), thus approaching the shape found in *P. schmitti*. Those from the first three stations also have slightly longer and more numerous setae on the legs. For the moment, these specimens are regarded conspecific with “typical” *P. kempfi*.

A specimen from PILLSBURY St. 722 has one abnormal 4th leg, which bears two cement gland tubes, one longer (of normal length and of normal position) and one shorter (slightly distad of the first) (Fig. 8c).

The differences which separate *P. kempfi* from *P. schmitti* are enumerated under the latter species.

### *Pallenopsis (Pallenopsis) childi* new species

Figures 9 and 10

**Material.**—1 ♀ (holotype), 4 ♀, 4 ♂ (paratypes); GERDA St. 1037 (Straits of Florida): 24°50'N, 80°37.5'W–24°50'N, 80°35.5'W; 37–42 m; 26-II-1969. 1 ♂; GERDA St. 984 (Straits of Florida): 24°05'N, 80°20'W; 86–126 fm (157–230 m); 5-III-1968. 1 ♂; GERDA St. 989 (Straits of Florida): 24°07'N, 80°11'W; 18–96 fm (33–176 m); 6-III-1968. 1 ♂, 1 ♀; GERDA St. 1039 (Straits of Florida): 24°49.1'N, 90°32.8'W–24°50'N, 80°31.6'W; 88–93 m; 27-II-1969. 1 ♂; GERDA St. 1300 (Straits of Florida): 24°51'N, 80°35'W; 69–64 m; 27-III-1971. 1 ♀; PILLSBURY St. 1279 (S of Hispaniola): 17°32.6'N, 71°34.8'W; 35–128 m; 18-VII-1970.

**Description.**—Resembling *P. schmitti* and *P. kempfi* by presence of long dorsal and lateral setae on tibia 1. Principal difference—presence of long ventral and ventrolateral setae on proximal half of femur and of long lateral setae on coxa 2 (“long” means: as long as or longer than diameter of segment).

Lateral processes with short distal setules. Abdomen long. Ocular tubercle slightly tapering, with rounded tip and small distal process; anterior eyes only slightly larger than posterior ones.

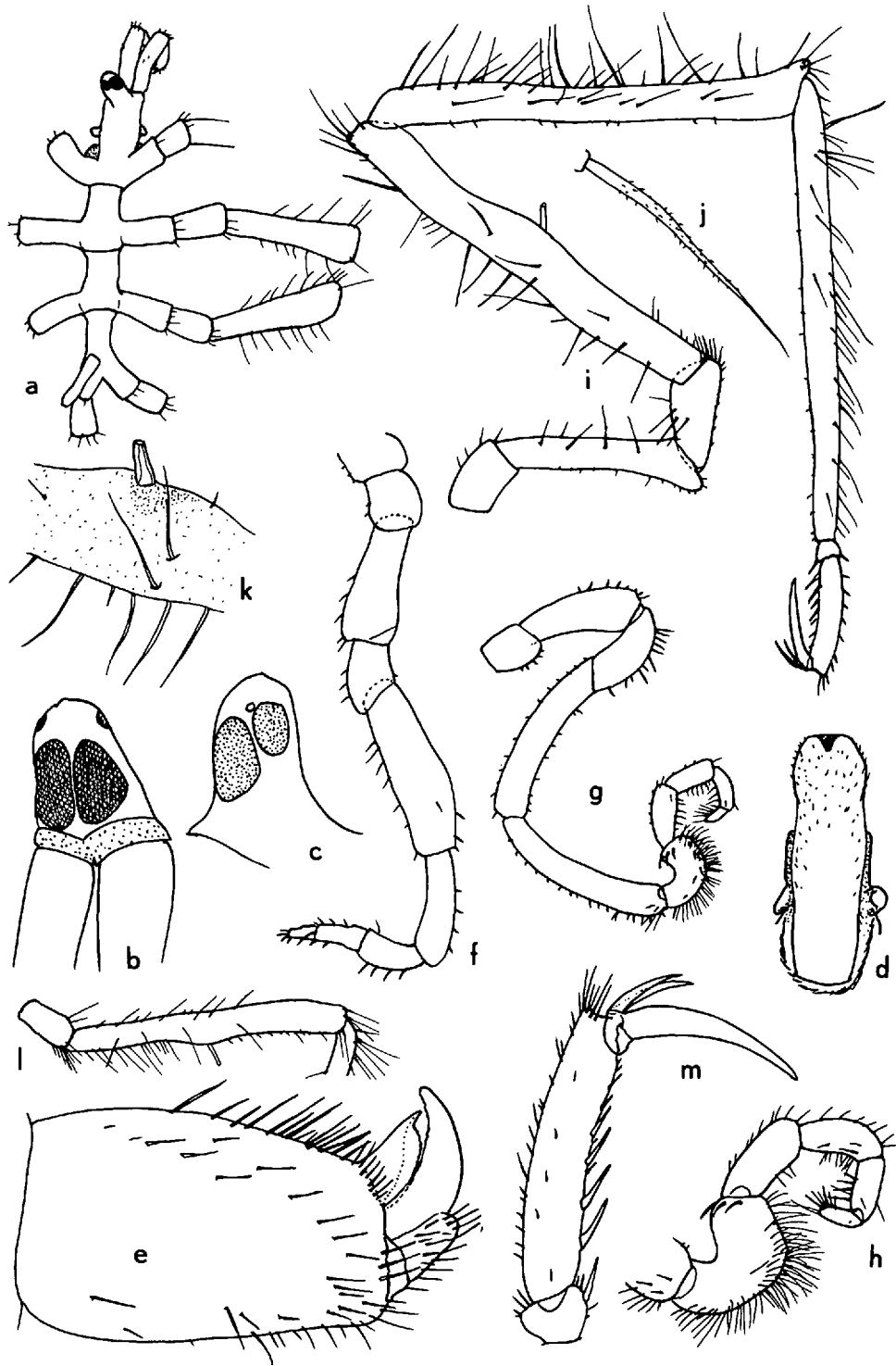


Figure 11. *Pallenopsis (Pallenopsis) varioculata* new species (♂ from PILLSBURY St. 835; ♀ from PILLSBURY St. 684): a, trunk ♂, dorsal; b, ocular tubercle ♂, frontal; c, ocular tubercle ♂, from the left; d, proboscis ♂, ventral; e, chela ♂; f, oviger ♀; g, oviger ♂; h, distal oviger segments ♂; i, fourth leg ♂; j,



Chelifore scape 1-segmented; chela with elongate-rectangular palm; spiny cushion rather well-developed; movable finger longer than immovable one; both without teeth.

Palp usually in shape of elongate papilla. In male paratype (Figs. 9d and 10c) palp shows curious anomaly: at both sides 2-segmented; globular basal segment bears slender, cylindrical distal segment.

Male oviger similar to that of *P. kempfi* and *P. schmitti*. Female oviger 8-segmented; segment 5 very elongate (thin and slender). Segments 6 and 7 also elongate, subequal; segment 8 elongate, but shorter than 7.

Legs slender; male genital spur (on legs 3 and 4) hardly developed. Distoventral corner of coxa 3 with rather long spines. Cement gland tube short, less than half as long as femoral diameter. Tibia 2 not longer than femur or tibia 1. Propodus with 3 long heel spines; auxiliary claws distinctly longer than half the main claw.

*Measurements of Female Holotype (in mm).*—Trunk length (frontal margin cephalic somite to tip 4th lateral process) 8.5; width across 2nd lateral processes 4.5. Fourth leg: 1st coxa 1.2; 2nd coxa 4.0; 3rd coxa 2.1; femur 9.3; 1st tibia 8.9; 2nd tibia 8.7; tarsus 0.42; propodus 2.07; claw 1.02; auxiliary claws 0.71.

*Remarks.*—The female oviger, the short cement gland duct, and the short 2nd tibia are reminiscent of *P. kempfi*, and the long auxiliaries of *P. schmitti*. Both these species lack long setae on the 2nd coxa and on the ventral margin of the femur.

The present records are restricted to the Straits of Florida and the northern Caribbean.

*Etymology.*—Named after C. Allen Child, Washington, in recognition of his various excellent papers on pycnogonid taxonomy.

***Pallenopsis (Pallenopsis) varioculata* new species**

Figure 11

*Material.*—1 ♂ (holotype); PILLSBURY St. 835 (SE of Trinidad): 09°36'N, 60°10'W; 48 m; 30-VI-1969. 1 ♂, 1 ♀ (paratypes); PILLSBURY St. 684 (off Surinam): 07°19'N, 56°51'W; 30–32 fm (55–59 m); 14-VII-1968.

*Description.*—Closely resembling *P. childi*, but anterior two eyes very much larger than two posterior ones (almost equal in size in *childi*).

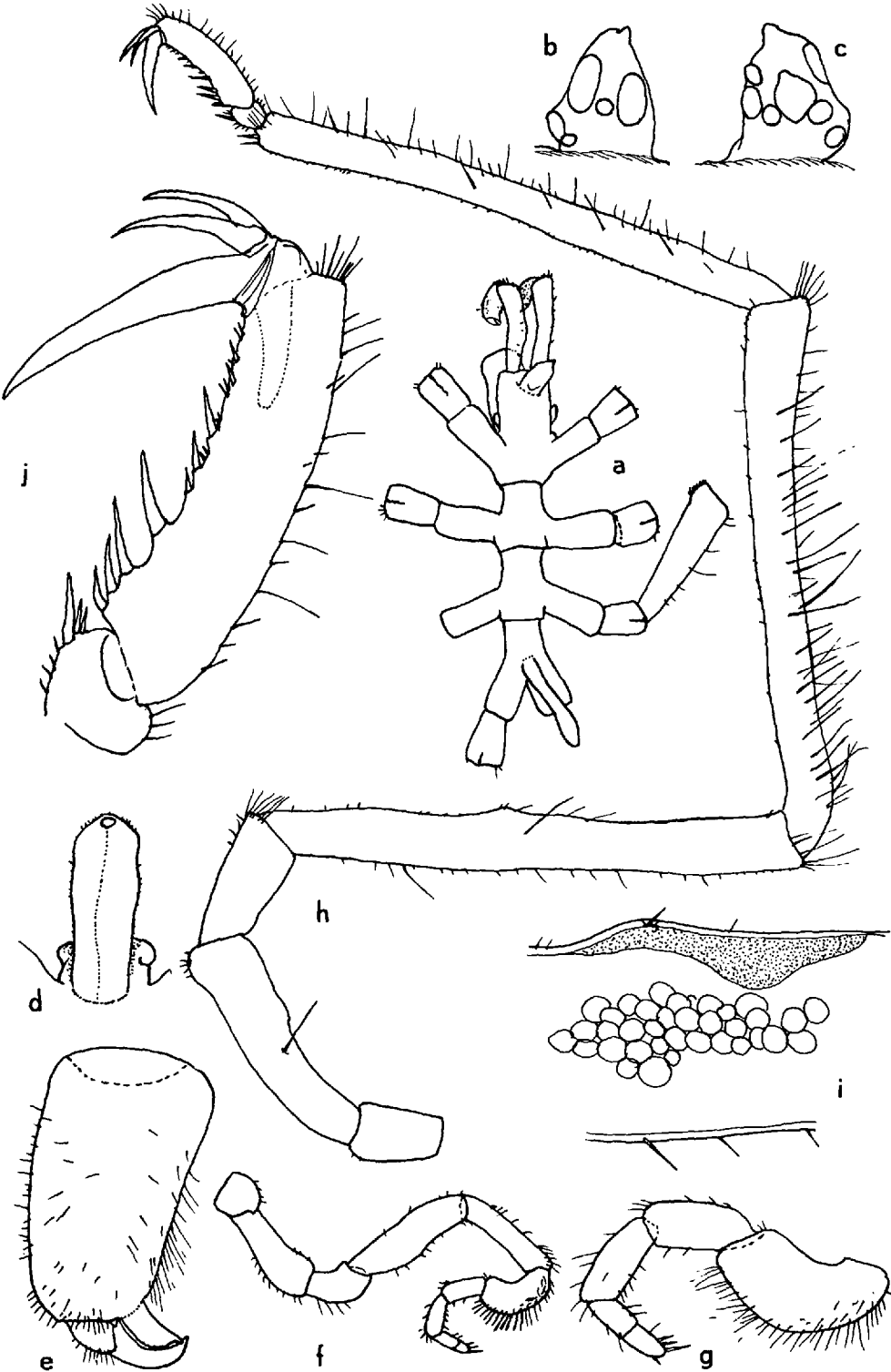
Male oviger with very strongly curved 6th segment (just as in *childi*). Female oviger resembles more closely that of *P. kempfi* and *P. schmitti*, in that segments 5 and 6 not exceedingly elongate.

Coxa 2 setose, though perhaps slightly less so than in *P. childi*. Dorsal margin of femur with several long setae, but ventrally directed setae (characteristic for *P. childi*) lacking. Tibiae also setose. Tibia 2 longer segment. Cement gland duct short. Propodus slender, claw very long, auxiliary claws distinctly less than half as long as main claw.

*Measurements of Male Holotype (in mm).*—Trunk length (frontal margin cephalic somite to tip 4th lateral process) 7.3; width across 2nd lateral processes 3.8. Third leg: 1st coxa 1.0; 2nd coxa 3.7; 3rd coxa 1.5; femur 7.4; 1st tibia 8.0; 2nd tibia 8.6; tarsus 0.25; propodus 2.30; claw 1.46; auxiliary claws 0.64.

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←  
seta of this leg, more strongly enlarged; k, cement gland duct, third leg ♂; l, aberrant cement gland (♂ from PILLSBURY St. 372, see text); m, distal segments of fourth leg ♂.



**Remarks.**—The strongly enlarged (and darkly pigmented) anterior eye pair distinguishes the new species from *P. schmitti*, *P. kempfi* and *P. childi*. It can be distinguished from *P. childi* also by the much shorter auxiliary claws, the absence of ventrally directed setae on the femur, the less elongate 5th oviger segment (♀), and the longer 2nd tibia. From *P. schmitti* it is likewise distinguished by the shorter auxiliaries, the more strongly curved 6th oviger segment (♂), the shorter femoral gland duct, and the presence of long coxal setae. From *P. kempfi* it differs by the longer 2nd tibia, the presence of long coxal setae, and the more strongly curved 6th oviger segment (♂).

A specimen from PILLSBURY St. 372 differs from "typical" specimens of *P. varioculata* in having a longer cement gland duct (Fig. 11 l). Similar variations have been observed in *P. kempfi* and the taxonomic value of this character remains dubious. This PILLSBURY station has the position 09°45'N, 76°12.0'W–09°48'N, 76°09.6'W (Atlantic coast of Colombia), 55–45 fm (101–82 m), 13-VII-1966.

**Etymology.**—From the Latin words *varius* (=different) and *oculata* (=eye-bearing), alluding to the size difference between frontal and caudal pair of eyes.

**Distribution.**—The few available records of *P. varioculata* are from the northern margin of the South American continent.

***Pallenopsis (Pallenopsis) mixta* new species**

Figure 12

**Material.**—1 ♂ (holotype); PILLSBURY St. 722 (Isla de Margarita, Venezuela): 11°04'N, 64°44'W–11°05.2'N, 64°45'W; 50 fm (91 m); 21-VII-1968.

**Description of Holotype.**—In general aspect very similar to *P. schmitti*. Ocular tubercle apparently regenerated after some previous injury: shows baso-posterior excrescence, bearing 4 small eyes, whereas left side of ocular tubercle bears 5 eyespots, some more distinctly pigmented than others. Right side has most normal aspect, with 2 large eyes and small lateral sense organ. Similar multiplication of eyes recorded by Munilla and Stock, 1984, in Namibian *Pallenopsis*.

Proboscis rather short, expanded in middle and at top.

Chelifore scape 1-segmented. Oviger segments 1 and 3 short; segment 4 almost 1.4 times as long as segment 2; segment 6 strongly curved and densely setose; segments 7 to 10 diminish gradually in size; segments 8 to 10 bear row of long ventral setae.

Legs slender. Second coxa 4 times as long as wide; all coxae not setose. Genital pores on distoventral corner of coxa 2 of all legs. Femur with some longer and several shorter setae. At 43% of its length with lowly conical swelling, bearing cement gland pore (no duct). Tibia 1 with many long setae; setae on tibia 2 also numerous but less long. Tibiae and femur of about equal length. Propodus about 4 times as long as wide; no well-developed heel; sole with row of spines, which diminish in size from proximal to distal. Auxiliary claws reach to about middle of main claw.

**Measurements of Holotype (in mm).**—Trunk length (frontal margin cephalic somite to tip 4th lateral process) 9.0; width across 2nd lateral processes 4.5. Third

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←  
Figure 12. *Pallenopsis (Pallenopsis) mixta* new species, ♂ holotype: a, body, dorsal; b, ocular tubercle from the right; c, ocular tubercle from the left; d, proboscis, ventral; e, chela; f, oviger; g, distal oviger segments; h, third leg; i, cement gland area; j, distal segments of third leg.

leg: 1st coxa 1.3; 2nd coxa 3.9; 3rd coxa 2.0; femur 8.9; 1st tibia 8.8; 2nd tibia 9.0; tarsus + propodus 2.3.

**Remarks.**—The specimen is apparently a hermaphrodite: female characters are the presence of ovaries in the legs and the presence of genital pores on all legs; male features are the presence of a cement gland and the structure of the oviger (segment 6 strongly curved).

There are very few hermaphrodite Pycnogonida. Child (1978) records only one: *Ascorhynchus corderoi* E. du Bois-Reymond Marcus, 1952. *Anoplodactylus jonesi* Child, 1974, stood candidate for hermaphroditism, but Child's analysis (1979) shows that this may be a case of male-female gynadromorphosis. Whether hermaphroditism is normal for the present species remains to be seen. It is apparently a rare species in the area under consideration, since the many hundreds of samples taken by the University of Miami cruises have yielded only a single specimen of this not so easily overlooked, large-sized animal.

At any rate, the present species can be distinguished from all American species by the femoral gland without excretory duct. In this respect, the new species resembles *P. bulbifera* Munilla and Stock, 1984, *P. brevidigitata* Möbius, 1902, and *P. macronyx* Bouvier, 1911. Of these, *P. bulbifera* has a globular 6th oviger segment in the male, whereas the two other species lack auxiliary claws.

**Etymology.**—The specific name, *mixta*, refers to the mixture of male and female characters of the holotype.

### *Pallenopsis (Pallenopsis) sp.*

**Material.**—1 ♂ (without legs); PILLSBURY St. 1225 (Jamaica): 17°42.5'N, 77°58.0'W–17°47'N, 77°55.8'W; 457–558 m; 7-VII-1970. 1 juv.; PILLSBURY St. 1333 (Nigaraqua): 12°15.8'N, 83°31.1'W; 11–13 m; 28-I-1971. 1 juv.; GERDA St. 1034 (Straits of Florida): 24°37.5'N, 81°05.4'W–24°26.3'N, 81°03.6'W; 66–68 m; 26-II-1969.

**Remarks.**—These damaged or juvenile specimens are unidentifiable.

### *Pallenopsis (Bathypallenopsis) longirostris* Wilson, 1881

*P. longirostris*, Stock, 1981: 462–463, fig. 5.

**Material.**—1 ♀; ISELIN St. 168 (Bahamas): 24°26.5'N, 77°23.3'W–24°28.6'N, 77°24.7'W; 1,570 m; 7-II-1974.

**Remarks.**—The distinction of this species has been discussed elsewhere (Stock, 1981). This is the southernmost record of the species.

### *Pallenopsis (Bathypallenopsis) mollissima* (Hoek, 1881)

*atlantica* new subspecies

Figures 13 and 14

**Material.**—1 ♂ (holotype); PILLSBURY St. 1181 (W of Haiti): 18°51'N, 74°30'W–18°46.8'N, 74°35.9'W; 2,489–2,548 m; 1-VII-1970. 1 ♀ (allotype); PILLSBURY St. 748 (Bonaire Trench): 11°24.8'N, 67°10.1'W–11°36'N, 67°06'W; 1,020–975 fm (1,865–1,783 m); 25-VII-1968. 1 ♀ (paratype); PILLSBURY St. 675 (off Surinam): 08°26'N, 54°19'W; 675–695 fm (1,234–1,271 m); 12-VII-1968. 1 ♀ juv.; PILLSBURY St. 1178 (W of Haiti): 19°14'N, 73°14'W–19°25'N, 73°09'W; 1,766–1,903 m; 30-VI-1970.

**Description.**—Very similar to *P. mollissima* (Hoek, 1881) (Stock, 1975: 1040), known from single locality east of Honshu, Japan. Only damaged female of *P. mollissima* known. Present subspecies from Atlantic shows slight difference in ♀ oviger. 3 females caught by PILLSBURY of different age stages, as shown by overall size, degree of elongation of distal oviger segments, and increase in number of

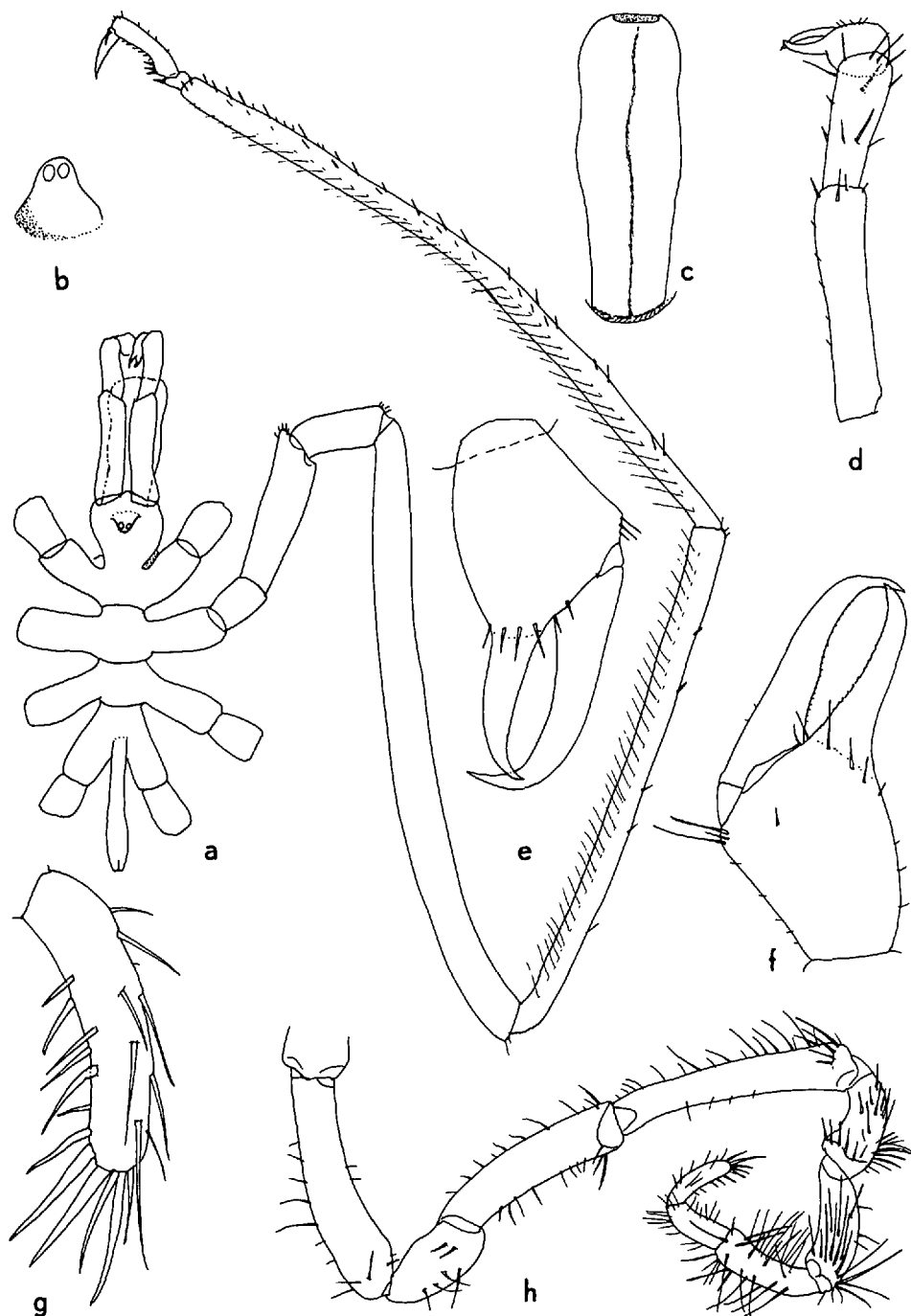


Figure 13. *Pallenopsis* (*Bathypallenopsis*) *mollissima* (Hoek, 1881) *atlantica* new subspecies (♀ from PILLSBURY St. 748, ♂ from PILLSBURY St. 1181): a, trunk and second leg, ♀, dorsal; b, ocular tubercle, frontal, ♀; c, proboscis, ventral, ♀; d, chelifore ♀; e, chela ♀ (PILLSBURY St. 675); f, chela ♂; g, distal oviger segments ♂; h, oviger ♂.

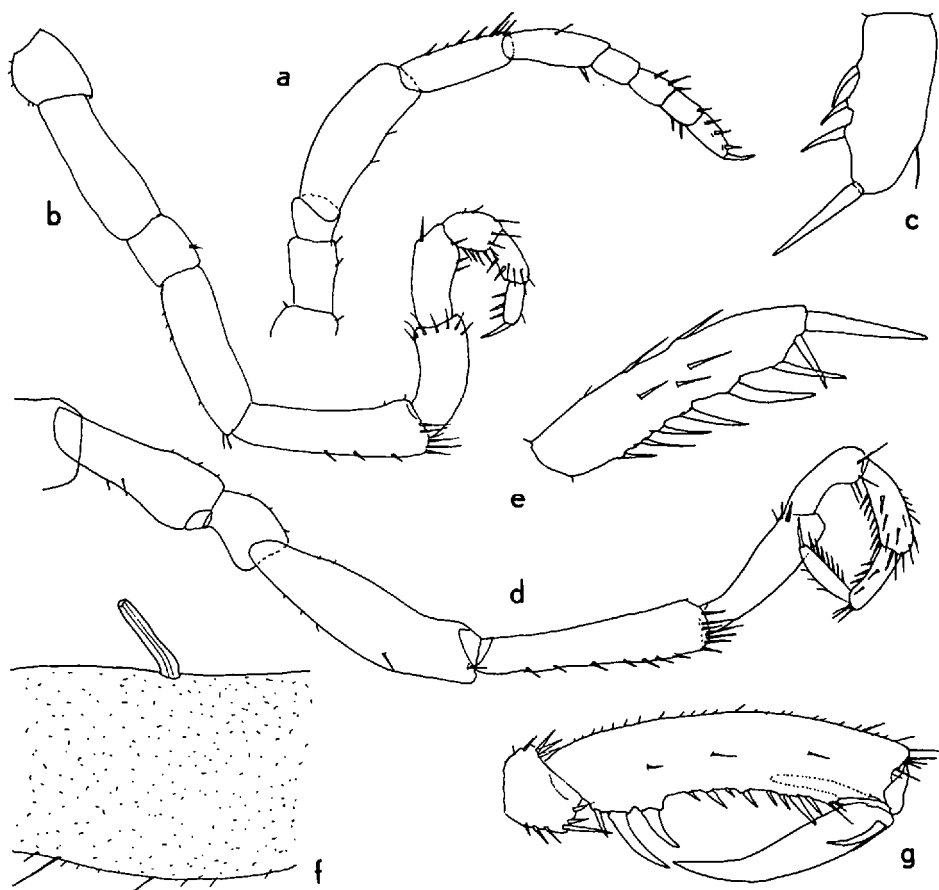


Figure 14. *Pallenopsis* (*Bathypallenopsis*) *mollissima* (Hoek, 1881) *atlantica* new subspecies: a, oviger ♀ (PILLSBURY St. 1178); b, oviger ♀ (PILLSBURY St. 675); c, distal segments of oviger ♀ (as b); d, oviger ♀ (PILLSBURY St. 748); e, distal segments of oviger ♀ (as d); f, cement gland duct ♂ (PILLSBURY St. 1181); g, distal segments of fourth leg, ♂ (as f).

spines on oviger segment 10 in older specimens. In all stages examined in this study, genital pores clearly visible; so, specimens, though of different age, all mature. All stages have 7th oviger segment (♀) much less setose than holotype of *P. mollissima*.

Since no males of *P. mollissima* s. str. known, and since holotype lacks all distal leg segments, more detailed comparison remains impossible.

Male specimen of *P. (B.) mollissima atlantica* not taken at same station as females; nevertheless presumed conspecific with females. Male chela differs from females in having minute teeth on fingers of chela (Fig. 13f).

From *P. (B.) paramollis* Stock, 1975, West-Pacific species, *P. (B.) m. atlantica* differs in following respects: Male—oviger segment 7 armed with very long setae (short and sparse setae only in *paramollis*); female—oviger segment 6 slightly over half as long as segment 5, or even shorter (in younger specimens); both sexes—fingers of chela shorter.

In shortness of oviger segment 6 (♀) and of fingers, Atlantic specimens agree better with *P. (B.) mollissima* than with *paramollis*.

*Measurements* (♀, PILLSBURY St. 748) in mm. — Trunk length (frontal margin cephalic somite to tip 4th lateral process) 12.5; scape segment 1 3.29; scape segment 2 2.00; length proboscis (ventral) 7.29; greatest diameter proboscis 2.15. Second leg: femur 25; 1st tibia 18.5; 2nd tibia 30.

*Pallenopsis (Bathypallenopsis) calcanea* Stephensen, 1933

*P. calcanea*, Hedgpeth, 1962: 487–491 (earlier refs.); Hedgpeth, 1969: 26; Nesis, 1970: 168; Turpaeva, 1971: 286; Clark and Carpenter, 1977: 613; Stock, 1978a: 216.

*Material*. — 1 specimen; PILLSBURY St. 462 (Bonaire Trench): 11°32'N, 67°39.5'W; bottom at 1,030–1,035 fm (1,884–1,893 m), gear at ca. 910 m (bathypelagic); 29-VII-1966.

*Remarks*. — This is a well-known bathypelagic species, recorded from all major oceans, but not yet known from the Caribbean.

*Pallenopsis (Bathypallenopsis) tydemani caraibica* Stock, 1975

*P. (B.) tydemani caraibica* Stock, 1975: 1033–1036, figs. 31d, 32; Child, 1982a: 30–31.

*Material*. — 1 ♀; PILLSBURY St. 672 (off Surinam): 07°37'N, 55°22'W–07°37'N, 55°27'W; 730–667 fm (1,335–1,220 m); 11-VII-1968.

*Remarks*. — Previously recorded from deeper waters off Florida and the Bahamas, New England and Ireland. The PILLSBURY record forms a southward extension of its geographical range.

Genus *Anoplodactylus* Wilson, 1878

This genus is quite well represented in the West Indies (Stock, 1975; Child, 1977b, 1979). No new species were encountered during the present study, but several rare species have been re-discovered, and a new variety is described.

*Anoplodactylus insignis* (Hoek, 1881)

*A. insignis* Stock, 1975: 1056–1058, fig. 44 (refs.).

*Material*. — 1 ♂; PILLSBURY St. 654 (N of Guiana): 06°07'N, 53°19'W–06°08'N, 53°21.5'W; 17 fm (31 m); 2-VII-1968. 1 ♂; PILLSBURY St. 759 (off Paraguana, Venezuela): 12°09'N, 69°49.0'W–12°11.3'N, 69°50'W; 19–20 fm (35–37 m); 21-VII-1968. 1 ♀; PILLSBURY St. 857 (E of Grenada): 12°23.5'N, 61°21.6'W; 9–348 m; 3-VII-1969. 1 ♂, 1 ♀; GERDA St. 1033 (Straits of Florida): 24°36.2'N, 81°06.5'W–24°36.6'N, 81°05.8'W; 42 m; 26-II-1969. 1 ♀; GERDA St. 1300 (Straits of Florida): 24°51'N, 80°35'W; 69–64 m; 27-III-1971.

*Remarks*. — One of the larger and more common species in the West Indies.

*Anoplodactylus insignis* (Hoek, 1881) *calcaratus* new variety  
Figure 15a, b

*A. insignis* (part), Stock, 1975: 1058 (only the LUYMUS St. 51 record).

*Material*. — 1 ♀ (holotype); GERDA St. 1276 (Yucatan Channel): 21°02'N, 86°28.5'W; 77–160 fm (141–293 m); 21-VIII-1970. 1 ♂, 3 ♀ (paratypes); PILLSBURY St. 736 (Venezuela): 10°57'N, 65°52'W–11°03'N, 65°55'W; 38–85 fm (69–155 m); 22-VII-1968. 1 ♀; PILLSBURY St. 900 (NW of Barbados): 13°38.5'N, 60°58.3'W; 18–27 m; mg-VII-1969. 1 ♂; PILLSBURY St. 938 (E of Guadeloupe): 16°13'N, 61°09'W; 33–37 m; 16-VII-1969.

*Diagnosis*. — New variety agrees with nominate form in all structural details (morphology of chela, proboscis of both sexes, oviger, cement gland . . .), but has 1 low anterior plus 1 long posterior spur on dorsal surface of coxa 1, rather tall spur on lateral processes, very tall distal femoral spur plus two smaller spurs on anterior

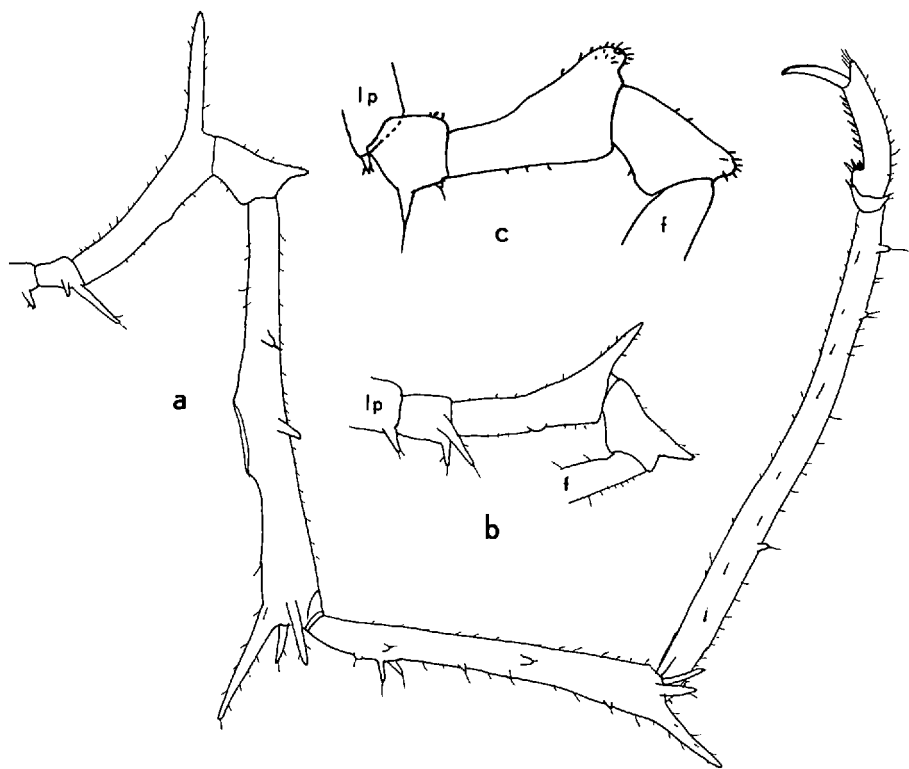


Figure 15. a, b, *Anoplodactylus insignis* (Hoek, 1881) *calcaratus* new variety ♂ from PILLSBURY St. 736: a, fourth leg; b, basal segments of first leg. c, *Anoplodactylus simulator* Stock, 1975, ♀ from GERDA St. 978: basal segments of third leg (lp = lateral process; f = femur).

and posterior surfaces of femur, several tall dorsal spurs in proximal part of tibia 1, and small spurs on dorsal margin of tibia 2.

In nominate form, spurs on lateral processes, coxa 1 and some of distal spurs on femur and tibia 1 are small; anterior and posterior spurs on femur are lacking or vestigial.

**Remarks.** — The observed differences in the development of the spurs are of degree rather than qualitative, and there is no difference in geographical or bathymetrical range of the two morphs. Therefore, only a varietal status is proposed. At first, I thought that the strongly spurred specimens might represent an older (or final) moulting stage, but a small male (PILLSBURY St. 938) also presents the salient spurs. In my 1975 paper, I noticed a specimen (from LUYMUS St. 51, off Surinam), with the same aberrant spurs. This specimen clearly belongs to the variety described here.

**Etymology.** — From *calcar* (Latin) = spur.

### *Anoplodactylus iuleus* Stock, 1975

*A. iuleus* Stock, 1975: 1069–1072, figs. 51–52.

**Material.** — 1 ♀; GERDA St. 849 (Straits of Florida): 25°54'N, 79°59'W–25°55'N, 80°00'W; 140 fm (256 m); 2-VIII-1967. 1 ♂, 1 ♀; GERDA St. 854 (Straits of Florida): 25°26'N, 80°02'W–25°28'N, 80°02'W; 123–119 fm (225–218 m); 25-VIII-1967.



*Remarks.*—The female is new to science; its proboscis is devoid of ventral outgrowths, but small rudiments of ovigers are present. Previously recorded from the same area and from Cuba. The present two records are from shallower waters than the previous ones.

*Anoplodactylus lentus* Wilson, 1878

*A. lentus*, Stock, 1975: 1055, figs. 42f-i, 43a-b (refs.).

*Material.*—1 ♀; PILLSBURY St. 588 (Yucatan Channel): 21°13'N, 86°25'W–21°16'N, 86°23'W; 62–130 fm (113–238 m); 14-III-1967. 2 ♂, 2 ♀; PILLSBURY St. 736 (Venezuela): 10°57'N, 65°52'W–11°03'N, 65°55'W; 38–85 fm (69–155 m); 22-VII-1968. 1 ♀; PILLSBURY St. 773 (off Maracaibo, Venezuela): 12°17.0'N, 72°15.0'W–12°18.0'N, 72°13.8'W; 33–35 fm (60–64 m); 29-VII-1968. 1 ♂, 1 ♀; PILLSBURY St. 775 (Atlantic coast of Colombia): 12°05'N, 72°38.5'W–12°06'N, 72°37'W; 223–315 fm (408–576 m); 29-VII-1968. 1 ♀; PILLSBURY St. 848 (N of Trinidad): 11°22.0'N, 61°26.4'W–11°23.8'N, 61°25.3'W; 146 m; 2-VII-1969. 1 ♀; PILLSBURY St. 907 (off Martinique): 14°26.8'N, 60°58.3'W; 115–214 m; 9-VII-1969. 1 ♂; GERDA St. 879 (Yucatan Channel): 21°00'N, 86°25'W–21°03'N, 86°25'W; 115 fm (210 m); 9-IX-1967. 1 ♀; GERDA St. 897 (Yucatan Channel): 20°59'N, 86°24'W; 160–115 fm (293–210 m); 10-IX-1967. 1 ♂, 1 ♀; GERDA St. 899 (W of Cuba): 20°57'N, 86°34'W; 90–22 fm (165–40 m); 20-VII-1970. 1 ♂; GERDA St. 951 (Yucatan Channel): 21°06'N, 86°28'W; 168–105 fm (307–192 m); 28-I-1968. 4 ♀; GERDA St. 1270 (W of Cuba): 21°05'N, 86°31'W; 113–255 fm (207–466 m); 20-VII-1970. 1 ♂, 5 ♀; GERDA St. 1275 (off Yucatan): 21°02'N, 86°29'W; 123–140 fm (225–439 m); 21-VIII-1970.

*Remarks.*—A large, and rather often collected species. The southernmost records were hitherto from the Yucatan Channel and the Saba Bank, hence the species is new to the northern margin of the South American continent.

*Anoplodactylus massiliformis* Stock, 1975

*A. massiliformis* Stock, 1975: 1063–1066, figs. 48–49; Child, 1979: 56.

*Material.*—1 ♂; PILLSBURY St. 423 (N coast Panamá): 09°37.2'N, 78°44.3'W–09°37.2'N, 78°45.4'W; 62 m; 19-VII-1966. 1 ♀; Hummelinck St. 1673 (Aruba): Spanish Lagoon, SE of bridge; 0–2 m; rocks at flood-gate, mud, *Rhizophora*; 24-III-1970.

*Remarks.*—Apparently a southern species, known from Brazil, the northern border of the South American continent to Panamá, and Barbados. From low tide to 100 m.

*Anoplodactylus multiclavus* Child, 1977

*A. multiclavus* Child, 1977: 593–596, fig. 4; 1979: 58, fig. 19d; 1982b: 372.

*Material.*—1 ♂ ovig.; Hummelinck St. 1549 (St. Vincent): Calliaqua Bay, near Johnson Point, sand, pebbles, *Conocarpus*, 0–1 m; 10-VII-1967.

*Remarks.*—The present male bears 3 to 5 cement gland cups per leg. The species was previously recorded from Belize, Panamá, and the U.S. Virgin Islands, in very shallow waters.

*Anoplodactylus petiolatus* (Krøyer, 1844)

*A. petiolatus*, Stock, 1975: 1072–1075, fig. 53.

*Material.*—1 ♀; PILLSBURY St. 100 (off Jacksonville, Fla.): 30°06'N, 78°42'W; 400 fm (732 m); 26-VII-1964.

*Remarks.*—This species is usually recorded from much shallower waters, even from the intertidal zone. It is not impossible that the present specimen originates from fouling of the ship's hull.

*Anoplodactylus simulator* Stock, 1975  
Figure 15c

*A. simulator* Stock, 1975: 1066–1068, fig. 50.

**Material.**—1 ♂ ovig.; GERDA St. 977 (Straits of Florida): 24°32'N, 81°08'W; 100 fm (183 m); 3-II-1968. 1 ♀; GERDA St. 978 (Straits of Florida): 24°32'N, 81°07'W; 100 fm (183 m); 3-II-1968.

**Remarks.**—The femoral spurs of the male specimen are slightly more slender than in the holotype (and only known specimen so far), likewise a male. In the female, the dorsal spur on coxa 1 and the distal spur on the femur are somewhat shorter than in the male. The ocular tubercle is also lower. The female genital spur, located on the ventral side of coxa 2 of all legs, is a low swelling (Fig. 15c). The proboscis of the female is devoid of ventral outgrowths. The female is new to science. The present localities are close to the type-locality and practically of the same depth.

Genus *Endeis* Philippi, 1843

This genus is classified with the Phoxichilidiidae, on a number of grounds: (1) the oviger and the cement glands correspond closely with *Phoxichilidium*; (2) the ocular tubercle is situated in a rather forward position; (3) I have observed (adult) specimens with neotenic chelifores, which look very much like a *Phoxichilidium* (usually, chelifores are lost by the adults, but this feature alone is considered to be of too little value to classify *Endeis* with a monotypic family of its own).

*Endeis flaccida* Calman, 1923

*E. flaccida* Stock, 1970: 3–4 (refs.); Stock, 1975: 1085; Child, 1979: 66.

**Material.**—♀; GERDA St. 1300 (Straits of Florida): 24°51'N, 80°35'W; 69–64 m; 27-III-1971.

**Remarks.**—Previous records in this geographical area (all from the Miami region) were from much shallower waters (0–8 m).

*Endeis mollis* (Carpenter, 1904)

*E. mollis* Bourdillon, 1954: 4 (refs.); Stock, 1957: 85; Stock, 1975: 1083–1085; Child, 1979: 66 (refs.).

**Material.**—1 ♂; PILLSBURY St. 687 (Guyana): 07°13'N, 57°36'W; 27 m; 15-VII-1968.

**Remarks.**—A pantropical species.

*Endeis* sp.

**Material.**—1 ♀; ISELIN St. 170 (Bahamas): 24°40'N, 77°32.5'W; surface; 8-II-1974.

**Remarks.**—In this difficult genus it is impossible to identify solitary females. The overall appearance of this specimen is that of *E. spinosa* or *E. meridionalis*.

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